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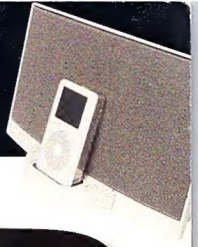

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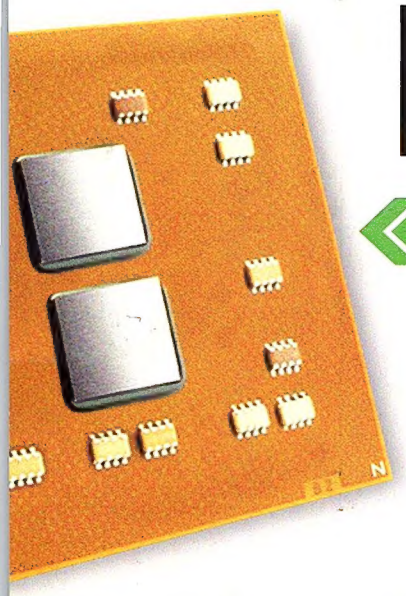

POWER AND SPEED

How dual-core CPUs double your PC's power

PLUS **First dual-video SLI benchmarks**

MACHINIMA MASTERS

Amateur moviemaking hits prime time

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Inside the Aurora FX55

SILENT PC PROJECT

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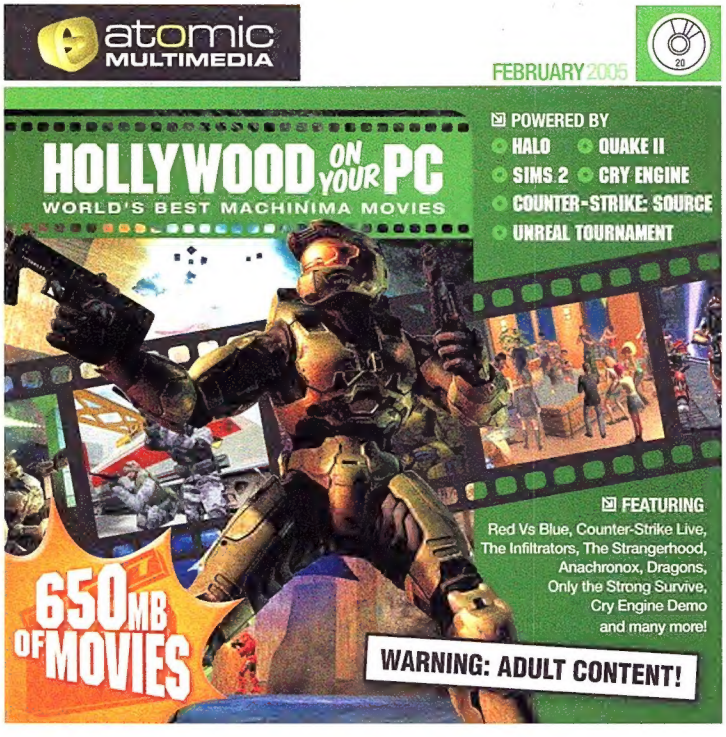

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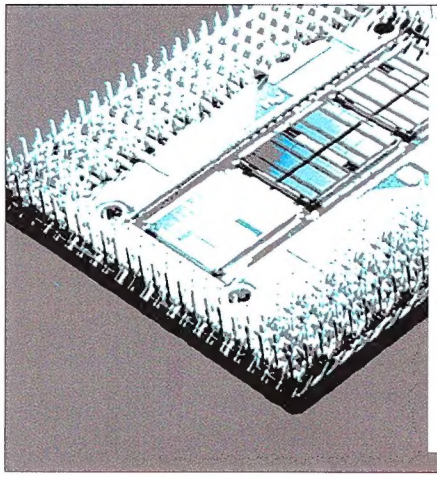
feature

Machinima 042

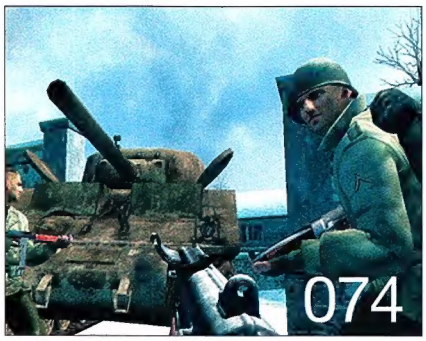
Games and movies usually don't mix – games of movies are bad, and movies of games worse. But what about movies made *using* games? Bet you didn't see that coming, especially with a title like *machinima*! Huh! If you've seen Red vs Blue, then you'll know, like us, that machinima is cool... so cool in fact we had Sholto MacPherson check it out.

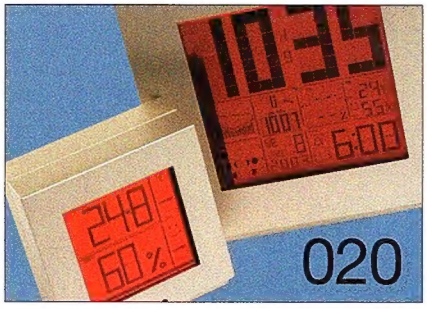


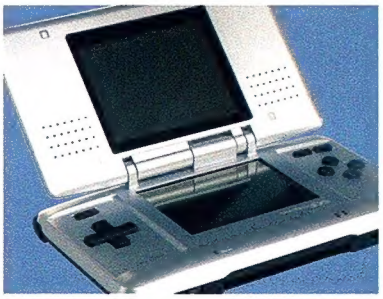
feature

The power of two 034

How do you break those damn speed barriers? If you're in a monster truck, the answer's easy – but it's not so clear when you're talking megahurtz and fillrates. Right now, companies are chasing the ideal of two heads being better than one – meaning multi-core CPUs and SLI setups. We sent James Wang to process some power.

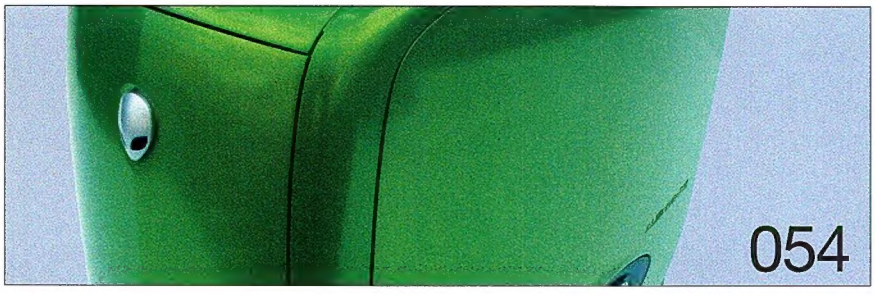


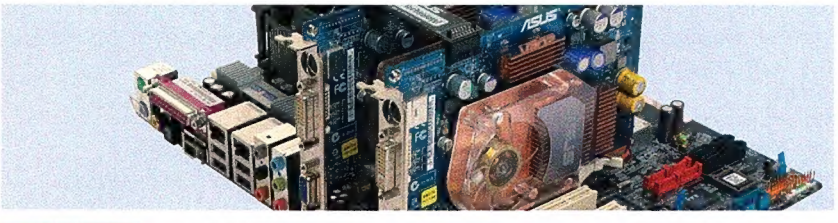




x-ray Nintendo DS 028

So, you have the PlayStation Portable, and then, you have the Nintendo DS. Okay, maybe you don't. We're speaking figuratively here, as though you had one in your left hand, and the other in your right, in order to do a comparison, much like Anubis' scale in the Egyptian afterlife – except there's no hungry Ammut waiting to devour your heart. Or anything even resembling a heart-devouring crocodile. Anyway, that's all beside the point. While we're still waiting for the wonders of the PSP to materialise in Oz, John Gillooly decided to have a deep, tantric look at the Nintendo DS, and all the secrets its silvery, double-screen case holds.
To that end, we have a genuine *Atomic* X-Ray just waiting to be read by yours truly... and by yours truly, we mean you, of course.





head to head Seeing double 030

Performance is key – not to a buried treasure or some babe's chastiy belt, but to the ultimate in gaming bliss. Understanding the importance of pushing polygons like a mad mofo, NVIDIA has designed a solution to all our graphical woes – the SLI configuration. Making use of two high-spec NVIDIA cards, John Gillooly put SLI to the test. Be prepared for an in-depth and sexy analysis of the next generation of graphics technology, courtesy of your friends at *Atomic*. If you thought LED fans and copper heatsinks were hot, just wait until you see the staggering coolness of SLI.

Power in numbers

Somehow I've been sucked into playing both World of Warcraft as well as EverQuest2, which means I effectively do not see other human beings anymore. Food can be delivered to my door, and water is free, so I'm content. And the odd thing is that I've discovered a previously unknown addiction within an addiction – when my World of Warcraft char made it to Ironforge and the auctioning house, I bathed in a new form of masssively multiplayer online gaming – bidding wars. There's something about scoring a good deal, or turning a profit, and it all comes down to the numbers. How much you can risk, how much you can make, and more is always the better high.

It's not a lot different with our PCs – weighing the value of more RAM, or a faster CPU, and maximising performance for the cost. It's all about the numbers.

Which is why the advent of dual-core processors and SLI video cards is a small revolution – a means to up the performance stakes through power in numbers. We all know two CPUs are better than one, but until now it hasn't really been feasible for most of us. But this may soon change with economically efficient dual-core systems. Though at the moment not a lot of software is designed to leverage multiple CPUs, with ubiquity will come support. When dual-cores are the norm, developers will find ways to use them to advantage – perhaps your media player will decode video on one core and sound on the other, or perhaps games will process graphics geometry on one and enemy AI on the other. And certainly, even now, it would be a boon for distributed computing. You may finally be able to fun Seti or Folding at full bore and not impact on your work (*cough* games). If you want to know more, James Wang looks at the progress of dual-core CPUs on *page 34*.

And though still young, NVIDIA is showing that two video cards are most certainly better than one. SLI is clearly the way of the future for FPS fanatics – and lets face it, that's people like us – though it may be a while before it becomes cost effective. Still, as the cutting edge in graphics performance we put one of the first SLI systems in Australia through its paces, and you can read results and see the benchmarks on *page 30*. And who knows, perhaps a dual-core SLI system will finally be able to run Morrowind. Wouldn't that be a sight.

Lastly if you love games and you love movies, then you'll love machinima. It's the future of amateur movie making, and game engines are the key tool. Read our introduction to it on *page 42* and check out the cover CD for some of the best machinima movies around.

Keep an eye out next month – we have a very special 50th issue collectors edition for you, it's pure Atomic to the core, and not to be missed!

Ashton Mills
Editor

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CDGuide

Machinations

Movies are expensive things to make. Actors, distributors, producers, special effects - it's all one big wad of red tape designed to suck money. So what does the budding writer/director do when they don't have access to the liquid budget of production companies? Grab the nearest game, of course.

The modding revolution that Doom started many years ago gave rise to the advent of complex, publicly available tools, allowing for nothing short of the complete customisation of games. Game cut-scenes started being produced in-engine rather than being pre-rendered, necessitating scripting tools to be built in order to control the onscreen characters and events.

After a while, some smart bugger realised that by combining the two, they could use their favourite game engine to create their own movies. Some interesting experiments and one online sensation – Red vs Blue – later, and the art of *machinima* (the fusion of machine and cinema) gained enough notoriety for companies to start building extra flexibility into their games, catering specifically for increased emotive interactivity and scriptability - or in less elaborate terms, they made movies look good. The amount of Half-Life 2 projects currently taking advantage of its incredible facial animation and lip-synching features are mind boggling.

Sure, the same hurdles of vision and the ability to produce a workable script still exist. You still need to have editing and storyboarding skills. You may need copious amounts of beer to convince your friends to provide voice talent. But suddenly you have a complete, rich game world and all its resources at your disposal, entirely free of charge. Your own little sandbox to play in where you make the rules. Out of this, some amazing pieces of art have emerged – and that's what we've put on this month's CD.

On the CD

We've sacrificed Boot Sector and Odd's End to cram the best machinima we could find onto the disc to help inspire your own projects. All the videos are encoded in the XviD codec, which is also included on the CD. If you find the movies aren't playing, it's more than likely you'll need to install this.

MORE MACHINIMA

Sometimes CDs aren't big enough. Other times copyright concerns mean we can't put things on. If you have the time and bandwidth, we recommend checking out the following machinima that couldn't make it to this month's CD.

A Great and Majestic Empire Series	www.agame-ukm.co.uk/
Clan Wars: Clan vs Noob	www.chipmunkninjas.com/cnp_clanwars.php
Dance Movie 2	www.archive.org/details/juniorx3_dancevideo2
Fire Team Charlie Series	www.xboxottawa.ca/
Max Payne 3: The Fall of Hobos and Senior Citizens	www.fileplanet.com/files/130000/135423.shtml
No Licence	www.shortfuze.co.uk/shortfuze/template/Machinima%2CBond.vm
Shack Stunts v2.0	www.fileshack.com/file.x?fid=2468

And of course if you have bandwidth to burn, you can browse the archives on www.machinima.com and www.archive.org/details/machinima.

ShortCircuits

Sophia Stewart, proposed creator of the Matrix concept, has been vindicated by the Central District Court of California in the US after six years of legal proceedings. Stewart, after watching the first Matrix film in 1999, had reason to believe her idea had been stolen by the Wachowski Brothers – the idea itself taken from a copyrighted manuscript she submitted to the Wachowskis called 'The Third Eye'. According to sources, the first page of the manuscript describes, in detail, the character of Neo. The case could see Stewart receiving the largest ever payout in the history of Hollywood.

IBM has sold its PC building business to Lenovo Group, a computer manufacturer in China, in order to focus its resources on larger and more profitable IT markets. Currently, IBM sits behind both Dell and HP in this area, and according to several news sites, only accounts for 10 percent of sales for the company. The deal is said to be worth almost US$1.2 billion to IBM, which includes US$650 million of stock in the Chinese computer company.

TrendMicro is currently offering antivirus software for mobile devices free of charge after a variant of Cabir, originally just a proof of concept worm designed to spread via Bluetooth, was discovered in the wild with a nasty payload. The payload, a trojan called 'Skulls', disables certain key functions on the devices it infects, including internet access and messaging services. At this time, the offer from TrendMicro is only open to users with smartphones running the Windows Mobile 2003 OS.

GeForce PS3

NVIDIA and Sony team up to create a graphics powerhouse for the Cell-powered PlayStation 3.

News of late has been rife about Sony's upcoming next-generation console, the PlayStation 3, the latest of these informative snippets being an agreement between the electronics giant and graphics chip manufacturer NVIDIA to produce a new GeForce GPU for the system.

Except it's more than just a snippet. A 7 December press release from NVIDIA confirmed the fact, stating that 'the companies have been collaborating on bringing advanced graphics technology and computer entertainment technology to SCEI's [Sony Computer Entertainment Inc's] highly anticipated next-generation computer entertainment system.'

'This collaboration is made under a broad, multi-year, royalty-bearing agreement. The powerful custom GPU will be the graphics and image processing foundation for a broad range of applications from computer entertainment to broadband applications.' NVIDIA's CEO, Jen-Hsun Huang, mentions in the release that NVIDIA and Sony have been collaborating on the project for the past two years.

The news comes hot on the heels of an announcement from IBM on the merits of programming for Cell-based platforms, including the PlayStation 3 – the importance of this statement stemming from the difficulty developers face when working with the PlayStation 2 architecture.

There are currently no details available on the capabilities or the name of the chip, however, the release does mention that the collaboration and its technological fruits will make their way into future Sony products. Manufacturing of the advanced graphics chip will occur at Sony's 'Nagasaki Fab2' facility once the design phase of production is complete.

Flowers from phones

Plant phone, grow sunflowers, says Motorola.

In an attempt to combat the growing rate at which consumers are discarding mobile phones for newer models in less than eco-friendly ways, Motorola has plans to market a series of phones made of biodegradable plastic – and sunflower seeds embedded in their cases.

As crazy as the idea sounds, Motorola believes there's potential in the idea. The polymer itself comes from US-based Pvaxx Research & Development, a materials manufacturer that specialises in environmentally-neutral products. A research team in Britain at the University of Warwick, which has been working with Motorola, has devised a way of placing the seed into the phone in such a way that it will grow once discarded in soil – as the plastic degrades and breaks down, it will produce nitrates for the seeds to feed on.

Motorola is yet to decide whether or not it will use the plastic in future developments. According to Pvaxx, work still needs to be done on perfecting the material, and the general quality of the plastic could still be improved. If the polymer is used in production though, Motorola has predicted it will see its first use in 'snap-on' phone covers and other such accessories.

Australian Game Developers Conference 2004

In the warm grasp of sunny December, Melbourne's Convention Centre between the 2nd and the 4th became a creative vortex for all things game-related, from texturing and modelling to programming and design.

This year's event, the sixth of its kind, had a star-studded cast of top developers both from places local and afar. Overseas visitors included Jason Ruben, ex-president and founder of Naughty Dog Software, most famous for its Crash Bandicoot series of games, and Bill Roper, ex-Blizzard captain and current CEO of Flagship Studios, while the native contingent consisted of stalwarts such as Anthony Oakden and Ed Orman of Irrational, Dan Teasdale from Pandemic and Matthew Ford and David Gillespie of Auran.

Micro Forte's John De Margheriti and Victoria's minister for Information and Communication Technology Marsha Thomson kicked off proceedings with opening addresses to welcome attendees and to raise important issues that would prevalent during the event. This was followed by a keynote speech by Ruben on the next generation of games development and the fears associated with embracing it.

Ruben's keynote marked the start of AGDC 2004 official, and among the swirling masses of students and event exhibitors, game developers valiantly made their way to conference rooms to unleash the secrets of game design on an unsuspecting flock of fledging artistes.

Day one—The Why of IP

Each exciting day of AGDC 2004 was broken into four conference blocks, with six sessions running concurrently during each block. The exception to this was day one, which, due to keynotes, open ceremonies and other official shindigs, only had three blocks.

For the first block, *Atomic*, being die-hard supporters of both licensing cool game IP and fans of Irrational and Auran, attended Ed Orman and David Gillespie's talk on *Sequels and Licences: How to work with someone else's IP*. Orman, drawing from his experience with the Fallout Tactics and the recently released Tribes: Vengeance, explained the benefits and pitfalls of developing a game using characters, story lines and environments from a different games company, movie studios and authors. One of the major issues Orman mentioned was existing players and the pressure they can place on development teams. He made it clear that fan bases and passionate game communities should be treated 'as a resource and not an authority'.

According to Orman, difficulties can also stem from not having a clear vision or idea of what a sequel should be, and how the source material should be made use of. It can be especially hard if the original development team no longer exists, as was the case with Dynamix, the owner of the Tribes franchise. He also warned that sequels are not always guaranteed successes – a misconception that can come from marketing teams or publishers.

Auran's Gillespie shared similar insights. Gillespie believed that newly established studios, and studios located in places such as Australia, cannot be fickle with which licences they want to work with. He also emphasised the importance of working with publishers – who will more than likely own the IP you're using – and the benefits of addressing their concerns and fears. On the other hand, Gillespie made it clear that if a publisher wants to do something with a licence that you know, as a developer, will not work, you should make the publisher understand exactly why their idea sucks.

'Simply take the publisher by the hand – in a non-condescending way – and sit them down and explain to them why it won't work,' he said.

The next session to pique our interests that day was a presentation by Christian Martinez of Australian-based Perception on *The Art of Texturing*. Martinez has worked for a variety of companies, including Irrational, creating art assets on a contractual basis. His creations include the skyboxes for Tribes: Vengeance and environmental texturing for the upcoming Freedom Force 2.

Perhaps Martinez' most prominent point concerned a comparison between the level of work required by a texture artist today, compared to that of seven years ago. According to Martinez, it was important for artists to make every pixel count in a texture, especially when they were no bigger than 256 x 256. These days, normal maps, specular maps and alpha masks need to be created, along with the base texture. Where artists would spend three hours creating an asset, they will use the same amount of time to just plan the creation of an asset that will take many weeks to come to fruition.

He also praised texture libraries – no matter the type of work, artists should always keep a library of their own art to

He also praised texture libraries – no matter the type of work, artists should always keep a library of their own art to draw from, be it photos or computer graphics. Martinez mentioned that often, he has scanned in objects as obtuse as wooden planks, to the leather surface of a briefcase, in search of the right 'look' for a texture.

Finally, day one wrapped up with a speech from the Lord of Zerg himself, Bill Roper. Roper actually stood in for another speaker, Don Daglow of Stormfront Studios, developer of The Lord of The Rings: The Two Towers, who was unable to make it to the presentation. To his credit, Roper delivered an engaging talk on the merits of design philosophies and the impacts they have on gamers with almost no preparation.

According to Roper, core to every game developed at Blizzard was an 'easy to learn – hard to master' mindset, and he citied Diablo 2 as the best example. '[We made] sure the foundation of the game was that anyone who played the game could finish it.'

Although excellent design does not happen randomly, he said, Roper viewed the process as organic, noting that it was surprising to watch people outside of the QA (Quality Assurance) team play the game during its early production, and be amazed by the things they tried, or didn't try, and how the development team would learn from this feedback.

'One of our preliminary goals at Blizzard [was to] create games that were definitive in their genres,' he said, reinforcing the merits of remaining flexible and listening to critique from unusual sources.

Day two – Day of the Portable PlayStations

With one hectic 24 hours of AGDC firmly emblazoned on the marble tablet of time, day two was primed and ready to go. Although the majority of Melbourne was, to their misfortune, unaware of the magic transpiring in its Convention Centre, it didn't stop the city from being a hive of activity on the morning of Friday the 3rd.

If the Convention Centre was famous for being anything other than a convention centre, it would be its large number of escalators, many of which you are required to ascend in order to reach most of AGDC's events.

The first of these to rope in *Atomic* on day two was Dan Teasdale's confessional on game design, called unsurprisingly 'Game Design Confessional'. Teasdale works at Pandemic Studios up in Brisbane as a designer. Using comedy as the engaging conversation tool that it is, Teasdale confessed to the crowd the mistakes he had made over his career, in regards to making games. In-between the self-depreciating jokes about his abilities though, Teasdale brought up some great points, and even dabbled in psychology to illustrate his sins.

According to Teasdale, using Perceptual Control Theory, one can explain a player's activities in a game, and by understanding PCT, a game designer can more easily anticipate how a player will react to a mechanic or game event. Basically, PCT boils down to *perception* and *reference*, and that all human actions are done in order to correct a *perceived error*. Humans will continue to take action until the error is corrected, and one's perception matches that of their reference, or vice versa. Either way, one of these values has to change and, humans will inevitably make choices based on the strength of their perception or the conviction of their reference. Teasdale also dissected some processes from Pandemic's latest title, Destroy All Humans!, the mistakes the team made in getting an E3 demo out, and the 'un-work' they had to do as a result, all the while using PCT to explain his actions and to justify design choices.

From there, *Atomic* headed off to the *Women in Games* presentation, located on the second floor, which thankfully, had elevator access. There, we were greeted by a panel of industry females consisting of Tess Snider from Imaginary Numbers and Kate Inabinet, an animator for Atari Melbourne House. The two discussed not just the representation of female characters and gender issues in games, but also women in the industry itself. Just as games are breaking out of the geek-only stereotype, so are the roles of women in the industry – these

only stereotype, so are the roles of women in the industry – these days they are programmers, designers and technicians as well as artists.

Then it was a short trip to the room next door to check out the PlayStation Portable, Sony's golden child. To be more exact, it was a presentation on programming for the platform, which, if you have a thing for maths, maths and more maths, would have had you quivering in delight. For the normal folk though, it was the demo of multi-play Wipeout at the conclusion of the seminar that made the day a shiny, bright diamond in the calendar of electronic entertainment.

Although only an early preview of the game, its lack of anti-aliasing certainly didn't detract from the sheer coolness of surveying an operating PSP. The only catches were the fact that the units were connected via cable, rather than 802.11b wireless, and powered through wall sockets and not batteries.

The magnanimous second day of AGDC 2004 concluded with a speech by Bill Roper on morale in development teams entitled *The Good, The Bad and The Ugly: Shootout at the OK Morale*. Drawing on his depth of expertise in running both a company and a game development team, Roper outlined strategies producers could make use of to increase dipping moral levels during crunch times and moments of doubt and weakness. Using his patented form of humour, Roper did a marvellous job of spreading his seed of experience into the Australian development community at large.

Day three – Of Keynotes and Kekes

The last day of AGDC 2004 surprisingly felt like the last day of AGDC 2004 – a lazy Saturday that did little to motivate the brain and body, especially after two gruelling days of conferences and intense note-taking.

The atmosphere however inside the Convention Centre was reasonably relaxed, with the event winding down and people taking a break from the strain of being perpetually on the go.

The presentation of note on day three was easily Robin Walker's breakdown of the design and production of Half-Life 2. Walker, recruited by Valve from the mod community many years ago, after masterminding the popular TeamFortress mod for Quake I, discussed the hierarchy of Valve's development teams. Segregated into 'cabals', each team would work on a separate section of the game, the paramount ideal being the less interaction the better.

While this might sound crazy to anyone who has every had to lead anything ever, Walker emphasised how fantastic the concept was, especially when founded on development of Source, the engine behind Half-Life 2, itself a 'compartmentalised' piece of technology. Through the use of 'symbolic linking', design teams were able to change parts of the game without interfering with other cabals. Walker praised the abstraction of elements, which although somewhat clinical, turned out to be the best way to do the game.

He also described in detail 'Choreo scenes', or scenes where the player watched characters interact for large periods of time. Valve designed its own Flash-like tool to construct these scenes, allowing cabals an enormous degree of flexibility, more than was available when creating Half-Life's scripted sequences. Actors where also built around a 'response system' that would do most of the hard work of generating appropriate conversational and gesture-related responses to player, NPC and world actions, leaving more time for the creative side of production.

The final curtain closed on AGDC with a discussion panel made up of Jason Ruben, Bill Roper, Adam Lancman of Atari and John De Margheriti. Posed with questions regarding the challenges ahead by journalist Steve Polak, the panelists debated the promises of mobile phones, wireless and online gaming services including distribution systems like Steam. All the panelists heartily recommended mobile phones and mobile gaming devices as a great platform for fledging developers to launch their careers, as the platforms themselves are still maturing and have some time to go before reaching critical mass.

They still believed that devices like Nokia's N-Gage, the PSP and the Nintendo DS are 'first-generation', and it will take time for them set-up roots in the games industry and the mobile community at large. According to the panel, consumers would also play a huge roll in deciding which platform would prevail over the others, if any at all.

Saying sayonara

AGDC 2004 is over for another year, and rumours are that next year it won't be held at the MCC. Shock horror.

It will, in fact, still be in Melbourne, deep in the cold winterland of Australia – if by winterland you mean the city CBD – the structure however remains undecided. *Atomic*, as always, will bring you coverage because we love developers, developers love us, and because, of course, you love hearing about it as much as we do.

Open sesame!

Daniel Rutter ponders the advantages of self-building devices.

I suspect, for some reason, that many of the people reading this are fairly conversant with the use and handling of the common screwdriver. Possibly also the spanner, and the hammer. Maybe even the pop rivet gun.

Fasteners don't take up a whole lot of the average nerd's brain space, though, because they never seem to generate any major news. Incremental improvements, sure, but if you brought an 18th century machinist to the present day and showed him what we use to hold stuff together when we want to be able to take it apart again, he'd recognise all of it.

Screws, nuts and bolts, nails, and rivets. That's it. He had 'em, we have 'em. Ain't much changed. Lock washers, pop-open fibro anchors, staple guns and hammer-in T-nuts wouldn't exactly stagger our friend from 1783.

Big news is coming, though. Say hello to 'smart fasteners'.

The basic idea of the smart fastener is that it can grab, and let go, by itself. You don't have to turn it or hit it or pull a piece of it out.

The first thing J. Random Slashdot Poster always says when he hears this is 'wow, so 1337 h4XXOrZ will be able to disassemble your car as you drive by, huh?'.

Fortunately, no. Smart fasteners won't do anything unless a tool's applying energy to them. That energy may be magnetic, or it may be electricity or heat, or the fasteners may get power from a bus that's separate from a radio frequency tool. But even in that last case the fasteners won't be permanently powered up, just waiting to be told to leave you sliding down the freeway holding your steering wheel.

There are lots of variably complex smart fastener actuator designs, but many of them use shape memory alloys that let the fastener engage and/or disengage in response to heat. The heat usually comes from an electrical resistance arrangement that warms the shape memory part of the fastener without making the rest of it very hot.

Current shape memory alloys don't have very high heat thresholds, so things assembled with these fasteners would probably fall apart in the sun – but we're working on that. Magnetic and electric-motor actuators, of course, don't have this problem.

The usual second response to this concept is 'well, so what, then? OK, it'll be nice to just touch a screw in an awkward place and have it drop out without a bunch of fiddling, but that's hardly going to revolutionise society.'

The basic idea of the smart fastener is that it can grab, and let go, by itself. You don't have to turn it or hit it or pull a piece out of it

O ye of little imagination. Just wait until you see what people make with these things.

At the moment, products like cars are spot welded together by robots that each do their little collection of welds as the assembly line passes them. One weld at a time.

A smart-fastened panel would cost rather more than a simple steel stamping to create, but could just be located and then locked into place in one operation. Every fastener on the panel could lock down simultaneously, click, when a robot or human worker applied power to the outside of the panel. One contact will do it, if the frame of the car is grounded.

The real magic, though, happens when you want to take a panel *off* again. If it's welded, this is annoying. If it's riveted or bolted, it's still fairly annoying, plus it may have come off all by itself when you least expected it. But with smart fasteners, removing parts and panels can be as easy as putting them on. And it should only happen when you want it to happen.

This ain't the half of it, though. Smart fasteners can *really* be smart; they can have their own little nugget of processing power.

The giant flaming eyes of the big media conglomerates snapped around to stare at smart fasteners as soon as someone mentioned that programmable ones could be used to make cables that can only be unplugged if the manufacturer gives you permission. But crap like that is only ever going to stump those of us who do not own a large slotted screwdriver and/or Dremel.

What's more interesting is that at the moment, designers have to think about how assemblers are going to be able to reach fasteners, and in what order. Rivets that can lock themselves in place when other stuff's already been installed over the top of them, even if it's just on a simple time delay, will be a big step forward in the creation of the ingenious tight packed assemblies that make the geekly life worthwhile.

And, of course, smart fasteners may actually give us the chance to look wizardly. Perhaps even in the way imagined by the Slashdot first-posters.

I remember the last time I was called upon to see what was wrong with someone's VCR. The final diagnosis was 'it's toast', but that need not detain us now; the important part was how impressed my friends were when I merely undid the four standard casing screws and bared the machine's guts with a scrape and twang of cheap pressed steel.

What if the 101-hex-bits-set of tomorrow is a pocket computer with a 'universal remote' program bearing bootleg codes for a thousand manufacturers' smart fasteners?

Simply point your magic box at your in-laws' featureless cubic black Sony 3DTV projector, issue the 'fastener bus powerup' followed by the 'release all' command, and the television will start taking itself apart – just like the Bluesmobile.

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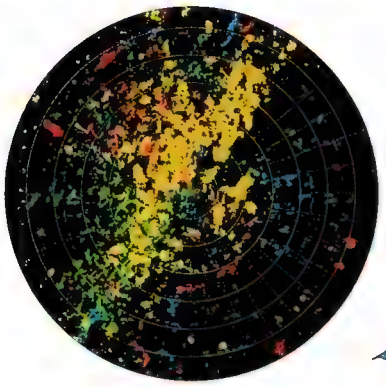

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Anticipate this

Ben Mansill presents his highly anticipated opinion page.

Let's bandy about a phrase. *'Most anticipated of all time'*. It sure packs a punch, don't it? It's almost 'greatest ever', but not quite. It *is* actually 'greatest ever' – but only until it happens, after which it may be relegated to something lesser, like 'one of the greatest ever'. Or perhaps 'memorable', if it was a great disappointment, but still, in the grand scheme of things, pretty darn good.

In the last month we've been trembling with extreme greatest ever anticipation. Like a volcano threatening to blow. Like the days of excitement before a particularly hot date which you just know will be a corker. Like a US election which almost promised salvation. 2004 sure did shape up to be the Year of Anticipation.

All damn year we anticipated. Then, in late October and early November the anticipation star went supernova. And there was a great deal of light.

Half-Life 2, Halo 2 and GTA: San Andreas were released. Each was acclaimed as 'one of the most anticipated games of all time', by gameco PR reps. Press release after press release. Another day, another Halo 2 press release. Each one yelling screaming and jumping up and down with the 'most anticipated' phrase. Exactly what determined Halo 2's entitlement to that phrase lies buried in a Microsoft marketing meeting a couple of years ago, but 'tis true we were at a minimum, very interested.

The anticipation carried us through a year of almost nothing. Doom 3, certainly highly anticipated, turned out to be turged and dull. IMHO. Far Cry, which wasn't really anticipated at all, filled the year with joyful happiness.

But it was the triumpherate of anticipation that took the gold.

It's poetic balance that the year ended with the anticipation relieved across each platform. HL2 for PC, Halo-2 for Xbox and GTA: San Andreas for PS2. I suppose there's Metroid Prime 2 for GameCube, too, but that's not so much highly anticipated, as desperately needed.

But from where is all this anticipation stemming? We were all 'really looking forward to' HL2, then the source code alleged theft elevated it into a higher realm of anxious awaitment. Halo was kinda cool, so there was nothing wrong about looking forward to the sequel, whilst GTA is so damn cool that a new version had us hanging bad. Oohhh the thrill. Anticipation really is terrific. As they say, it's what you can't see that's exciting. There's a sureity of hope, of confidence, with anticipation. One simply doesn't allow thoughts of potential disappointment to enter one's belief. Sure, we've been burned before. The brothers' Wachowski taught us a valuable lesson about trust, and how easy it is to transform what should be the greatest thing ever into a sucked off mess. Still, in games we trust, and there were enough millions of people in a lather of anticipation through '04 that you could run a Ukrainian city off the power it generated.

> **We got a press release for Halo 2 every time someone on the dev team farted, it seemed.**

Taking this excitement and gelling it into something tangible, measurable, nay, *edible,* was Microsoft. Their PR for Halo 2 was, for want of a better term, friggen crazy. Almost all Halo 2 press releases, in the leadup to launch, described the game as 'the most-anticipated video game of the year'. According to who? Measured against what? YARG! The cocky self-important presumption bordered on psychopathic. But it got worse. The day Halo 2 went gold the press release announcing *that* news was accompanied by comment from a PR person which described Halo 2 as 'the most anticipated game of all time'. OF ALL FRIGGEN TIME?

Of all time my arse. That's just being silly. Far more grounded are Vivendi Universal, with their PR for World of Warcraft. Here's a game which is 'eagerly awaited', according to the press release. Nice. Hyperbole kept in check, just a commentary on the state of the fans, really. And there was but one press release for the game, it's on-sale announcement. We got a press release for Halo 2 every time someone on the dev team farted, it seemed.

Perhaps a game has to be a sequel, in order to be entitled to be [insert fluffery adjective] anticipated? But Black and White wasn't a sequel, and that game was sure as hell looked forward to. Black and White also happened to have an extraordinary amount of PR behind it, for many unforgiving years. Is there something in that? Is the anticipation inverse to the quality, multiplied by the PR intensity, squared if it's a sequel?

Nah. It's simpler than that. Right now excitement of PR people roughly equals your excitement. They just use higher octane descriptions. They're less cool about stuff. Understatement is a dead art. Why provide a journalist with a useful piece of information, when you can instead inflate it to impossible proportions and wave arms around, jump up and down and suger coat it? That's what PR is for. To tell us what is exciting, because we can't tell ourselves.

I was watching Channel V the other day, they were vox-popping people in some shopping centre. Andrew G and his hair was asking hip cool kids: "what's better: sex, music or Halo 2?" Friggen what? At least half said Halo 2.

Well, 4-5 of them did, being half the kids they showed. I dearly hope they vox-popped at least a million kids to get the 4-5 Halo 2 endorsements they needed for that segment.

If not, the future of the species is bleak. Instead of banging out future generations, kids will either be playing the latest game, or anticipating the next.

I eagerly await the next game which is highly anticipated, or else I'm just not gonna give a damn. I'm spent.

If PR can't inflate my excitement glands, I'll be damned if I know what's really truly hot anymore.

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Got game?

Ahh, good times. It's summer again. The days are long, the air is warm. And it's gaming season. Tim Dean wonders what that means.

I've lamented many a time in this very column the dire times that have befallen PC gaming. Alas, those days are gone (at least over this summer). I'm actually sitting in front of my PC again, wistfully blowing things up, with the glimmer of a tear in my eye.

So all this got me thinking, as things tend to do: what is it that makes a killer game? I suppose the short answer is 'fun', and my guess at a long answer is as follows.

First off, what is a game? There seems to be a difference between gamey things, like Monopoly, tennis and Half-Life 2, and non-gamey things, like doing your tax return, walking and spreadsheets. I first thought that games were essentially challenging, but then there are lots of challenging things in our lives that aren't games. This is where I think conflict might fit in. Combine conflict with fiction, and we may be starting to get somewhere (as well as going some way to explain why games are more popular with males).

If you look at most games, you'll find conflict at their heart. This conflict could be against other players (or AI), or it could be against the environment (not in the literal sense, although that could make for an interesting game in itself: Oil Prospector: The Reckoning).

It's this conflict that presents us with the challenge, but also gives us another essential factor of a good game: reward. A good game needs to have reward at the end of the challenge tunnel, and this is one factor that accounts for the massive differences between games.

A reward may simply be to 'win', such as in noughts and crosses, although the abstract concept of 'winning' isn't terribly compelling by itself. Winning could also be considered the acquisition of a desired object or state, such as rescuing the princess.

Sometimes winning is the dismissal of an opponent, like in tennis or duels of skill. It could be growth or development, such as in role-playing games. Winning could also simply be survival.

Anyway, games hinge around a reward, and the winning or earning of that reward.

As a side note, a big part of games is their unpredictability, or at least the uncertainty of your winning. If a game is a foregone conclusion, it's not nearly as exciting. Soccer is an interesting example of this. Due to its nature (low scoring, long games, highly random elements such as penalty shootouts etc), even a mediocre team can beat a highly skilled team more often than in games like basketball (high scoring, short 'turns', more direct influence of skill on the outcome etc).

If you look at most games, you'll find conflict at their heart

This means the fans have more reason to go and see their team play, even if their team is not terribly good, because there's always the chance they might actually win.

This raises another point, which is immersion. Games, like many other forms of entertainment, are an escape from everyday life. I want to be carried away, to live an exciting life vicariously through the actions of the protagonist. This is true of games just as it is of cinema or books, although in slightly different ways. In the passive media, it's our natural empathy as human beings that makes us 'care' about the characters, so we share their highs, and suffer their tragedies. In games we need to add another factor to fill this picture: agency.

In a game, *we're* the protagonist. It's us who is determining whether we experience the highs or tragedies, and that adds a very compelling element to the mix.

Another important element of immersion is storytelling. Suspension of disbelief is a critical concept in fiction – the idea of encouraging the audience to let go of their normal critical capacities and 'pretend' that what's happening is real.

This brings me to another fascinating point. I reckon many games confound this desire to be considered 'real' with a mistaken idea of 'realism'. I think a lot of this had to do with where games started out.

The first computer games were so abstracted from the real world, in both graphics and gameplay, that it was natural to want to make things a little more realistic. Unfortunately many games developers didn't know when to stop and this wasn't helped by the graphics hardware companies, who continually pushed 'life like' graphics.

I wrote a bit about this many columns ago when I mentioned Cezanne, who noticed that objects in the world were made up of only a few primitive geometrical shapes.

Now, he could have used this observation to make more realistic art, but instead he used it to make less realistic art – but art that arguably told us more about the world we live in than just more accurate painting of a bowl of fruit.

See, it's reality that I'm trying to escape from in the first place. Reality is not incredibly exciting, that's why (arguably) The Sims is more entertaining than our own lives. A game that's too realistic can easily become quite tedious and unexciting. Flight simulators are a prime example of this. Sure, there are some enthusiasts who love flying an 18 hour flight in realtime, but they're few and far between. In fact, I reckon one of the reasons there aren't many flight simulators around these days is because they've over emphasised realism and have lost balance with gameplay.

Which brings us full circle – what *is* gameplay then? Ultimately, it may be a circular thing – gameplay is the combination of elements that makes a game fun. And fun is the short answer to what makes a good game.

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GEARBOX

1 GTA: San Andreas OST

Supplier: Vivendi Universal Games
Website: www.vugames.com.au
Phone: (02) 9978 7722 **Price:** $TBA

The unwashed masses may see Grand Theft Auto: San Andreas as a hit'n'run hip-hop simulator, but educated gamers know it as a snapshot of 1990's California. And that means the music too. This two disc soundtrack (which in a twist of cross media ownership is being distributed by Vivendi Universal, not Rockstar) spans music from Willie Nelson to Tupac. It's eclectic, which may mean that less tolerant music nerds will hate it. It also comes with a 20 minute DVD of machinima – a prequel to GTA.

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Website: www.pccasegear.com.au
Phone: (03) 9584 7266 **Price:** $25

Seeing as your skin is about as sensitive to the light spectrum as a vampire's, you rarely think about flicking on a bedroom light to see the keyboard. Dark is good. It's safe. Not because you can't touch type, of course (you call yourself a geek!), but a little glow is always cool and keyboards seem to look spookily swanky with one of these gentle cathode lights hovering above. With a base resembling a miniature two-buttoned mouse, this is a kick arse 5W worth of subtle glow for your keyboard.

3 Aluminium USB 2.0 Hub

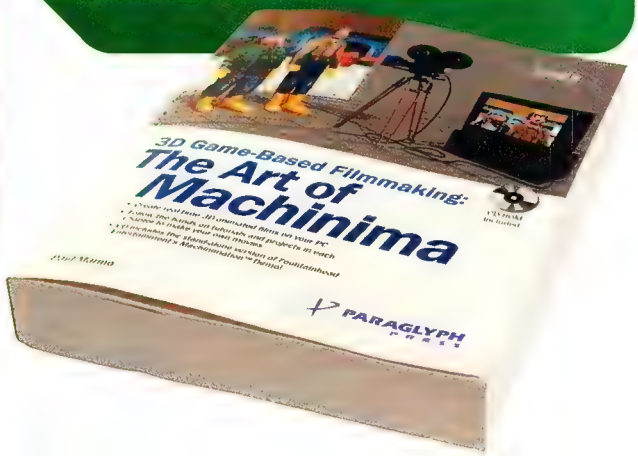
Supplier: Anyware
Website: www.anyware.com.au
Phone: (07) 3856 3999 **Price:** $34.95 ($44.95 powered)

All too often there's just plain not enough ports. Even if your case is riddled with USB, they always tend to find a way on filling themselves up. If you're shaking your head, then read this upside down for amusement. This slim and sexy aluminium USB 2.0 hub and has four ports, but ours only came packaged for passive use. It has a power port, but not the power pack – another $10 will get you that. Great for all those extra mouses and keyboards. And flash drives, even. Fun for the whole family.

4 The Art of Machinima

Supplier: Woodslane
Website: www.woodslane.com.au
Phone: (02) 9970 5111 **Price:** $79.95

The future of amateur filmmaking lies in the art of machinima – it's accessible, highly flexible and powerful enough to produce impressive films with a little time and patience. *The Art of Machinima* takes you through the basics of making your own films using popular game engines, from character choreography, camera positioning and audio/visual effects, to video capture devices. It even shows you how to package and distribute your masterpiece. Sick of Hollywood? Then show them how it's done!



5 Portable MPEG4 player

Supplier: Anyware
Website: www.anyware.com.au
Phone: (07) 3856 3999 **Price:** $189

Ever wanted to take your music, movies, *and* images with you wherever you go? Then this little baby is for you! A mere 160GB and small enough to almost fit in your fist, this portable player provides DivX, MPEG, MP3, Ogg Vorbis and WMA playback in stereo and 5.1 formation as well as composite, s-video and component output. All you need to bring to the party is a 2.5" hard drive, and an extensive collection of movies and music. It's like a little home theatre in your pocket!

6 Xcontroller

Supplier: Thermaltake
Website: www.thermaltake.com.au
Phone: (03) 9763 1622 **Price:** $35

Kicking it old school with analogue potentiometers, this 5¼ inch Rheobus controls four fans. Not nearly as advanced as the digital Aerocool GateWatch featured last month, but it's not about the bells and whistles. Well maybe just the whistles – there are three coloured LEDs mounted behind each dial. Low speed produces a blue outline, medium is green and high speed spits out red. Nifty, but with a small catch. The dials come off incredibly easily, though it's nothing some gaffer or superglue can't fix.

7 4D Steel mouse pad

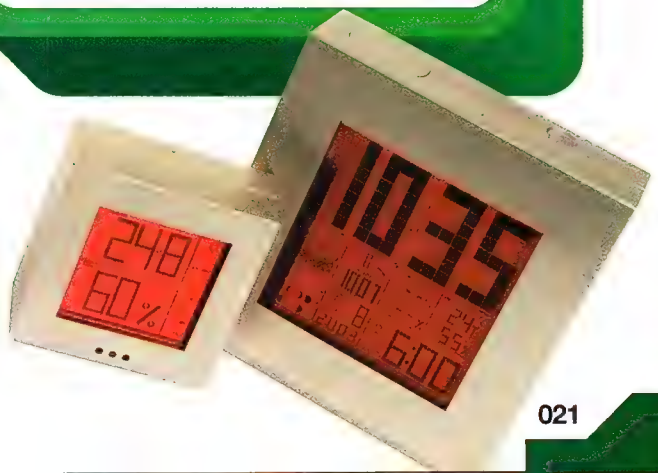
Supplier: Steelpad
Website: www.steelpad.com
Phone: N/A **Price:** US$24.95

Structured from plastic, this pad has a finer texture than the professional beast monger we checked out last month. The pad has two sides but forget about using an LED optical mouse on one of them. The other, however, is like hot Discovery Channel mouse lovin'. It's even supplied with the obligatory adhesive medical strip – make that 'Padsurfer Teflon tape' – for some good surface mouse rubbing friction. Or de-friction. Slightly less deluxe is its packaging, but it's still no way less a killer surface.

8 Starck Full Weather Station

Supplier: Oregon Scientific
Website: www.oregonscientific.com.au
Phone: 1300 300 155 **Price:** $450

Yep, it's a *Starck*. Now we're by no means hippy stylistic experts, but the design on this seems simplistic. What really slung us about this clock was the trippy LED time readout it can project on your ceiling. Then there's the features – a barometer, moon phase display and weather forecast. Worth bragging about. It also comes with a remote RF unit for grabbing outdoor stats like humidity or temperature. The most fully featured and suitably expensive bedside clock ever.



9 Atari Anthology

Supplier: Atari
Website: www.atari.com.au
Phone: (02) 8303 6800 **Price:** $49.95

Ah, the days of old when violent games didn't influence people and manuals were needed for onscreen characters. This collection of 85 games is one hell of a nostalgic trip back in gaming history. With such classics as Yars' Revenge, Asteroids and Tempest, there's no lacking in some good tear jerkers. The potential was there, but aside from split screen, there is no Xbox Live Warlords. Controls for some games are surprisingly touchy, but the overall reminiscent flavour is true to the 8-bit origins.

10 BTC 9019 URF

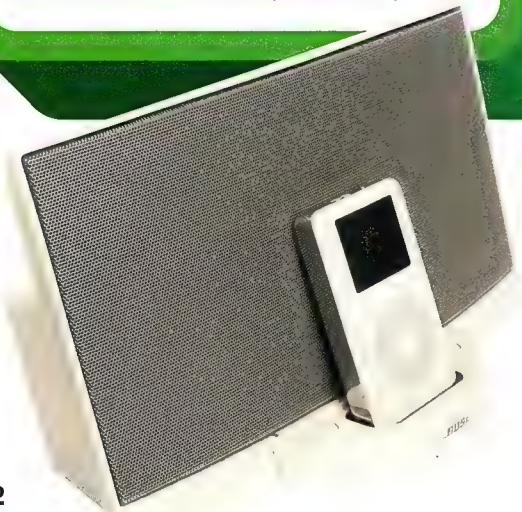
Supplier: HyperReality
Website: www.hyperreality.com.au
Phone: (08) 8381 6511 **Price:** $99

One of the weirder keyboards to hit the Labs, this claims to be a multimedia and gamer's keyboard. Well, the jury went out and immediately came back laughing. Essentially it becomes a colossal wireless console game controller. With mouse controls – an analogue stick and middle click on the right, and l/r mouse buttons on the left. Confused? We wouldn't recommend it for gaming, but on the other hand this is the ultimate choice for a HTPC setup. It doesn't get more convenient than this love child.

11 Bose SoundDock

Supplier: Bose
Website: www.bose.com.au
Phone: 1800 023 367 **Price:** $499

As iPods become ubiquitous, so do the mechnisms by which you can play their music. The Bose SoundDock is another gadget that wants to be your personal desktop stereo, but looks more like an albino boom box from the 80s. Aesthetics aside, it can belt out tunes with great clarity and little distortion even at ear-ripping volumes. Like other small systems of its ilk, its size doesn't mean great bass, and the price is somewhat wallet heavy, but the SoundDock's a neat companion for any iPod.



12 OCZ 600W PowerStream PSU

Supplier: Australia IT
Website: www.australiait.com.au
Phone: (03) 9543 5855 **Price:** $350

You can never have enough juice. If you're a true green-blooded Atomican, the more wattage you feed your machine, the more it uses. This'll keep the tiger down a little longer – a 600W (700W 60-sec peak) PSU that's surprisingly quiet considering its output capacity, ranging in at under 23dBA. It has six separate power rails to keep the current clean and the individual voltages are modifiable on the unit's back. Supporting the new power standards, this is a solid PSU to squeeze out them vibratin' electrodes.

If you're serious about gaming you should be wearing one of these!

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Pentium 4 530 (3.0GHz, 800fsb, 1MB)	280
Pentium 4 540 (3.2GHz, 800fsb, 1MB)	340
Pentium 4 550 (3.4GHz, 800fsb, 1MB)	430
Pentium 4 560 (3.6GHz, 800fsb, 1MB)	640

AMD Sempron Processors

Sempron 2400+ (1.67GHz, 333fsb, 256KB)	100
Sempron 2500+ (1.75GHz, 333fsb, 256KB)	120
Sempron 2600+ (1.83Hz, 333fsb, 256KB)	130
Sempron 2800+ (2.1GHz, 333fsb, 256KB)	170
Sempron 3100+ (1.8GHz, 400fsb,256KB)	190

AMD Athlon64 Socket754 Processors

Athlon64 2800+ (1.8GHz, 512KB)	200
Athlon64 3000+ (2.0GHz, 512KB)	220
Athlon64 3200+ (2.2GHz, 512KB)	290
Athlon64 3400+ (2.4GHz, 512KB)	350
Athlon64 3700+ (2.4GHz, 1MB)	700

AMD Athlon64 Socket939 Processors

Athlon64 3000+ (1.8GHz, 512KB)	240
Athlon64 3200+ (2.0GHz, 512KB)	300
Athlon64 3500+ (2.2GHz, 512KB)	410
Athlon64 3800+ (2.4GHz, 512KB)	990
Athlon64 FX53 (2.4GHz, 1MB)	1200

Dual DDR Matched Memory Modules

GEIL 512MB (2X256MB) DDR PC3200 Pack	145
GEIL 1GB (2x512MB) DDR PC3200 Pack	265
GEIL 1GB (2x512MB) DDR PC3200 UltraX Pack	440
GEIL 2GB (2x1GB) DDR PC3200 Pack	680
Kingston 512MB (2x256MB) DDR PC3200 Pack	150
Kingston 1GB (2x512MB) DDR PC3200 Pack	290
Corsair 1GB (2x512MB) XMS3200XL Pack	450

IDE ATA100 Hard Drives

Western Digital 80GB 7200rpm 8MB, 3yr Wty	100
Western Digital 120GB 7200rpm 8MB, 3yr Wty	130
Western Digital 160GB 7200rpm 8MB, 3yr Wty	140
Western Digital 200GB 7200rpm 8MB, 3yr Wty	175
Western Digital 250GB 7200rpm 8MB, 3yr Wty	265
Seagate 120GB 7200rpm 8MB, 3yr Wty	135
Seagate 160GB 7200rpm 8MB, 3 yr Wty	150
Seagate 200GB 7200rpm 8MB, 3 yr Wty	180

SerialATA S-ATA150 Hard Drives

Western Digital 80GB 7200rpm 8MB, 3yr Wty	100
Western Digital 120GB 7200rpm 8MB, 3yr Wty	135
Western Digital 160GB 7200rpm 8MB, 3yr Wty	160
Western Digital 200GB 7200rpm 8MB, 3yr Wty	190
Western Digital 250GB 7200rpm 8MB, 3yr Wty	275
Seagate 80GB 7200rpm 8MB, 3yr Wty	110
Seagate 120GB 7200rpm 8MB, 3yr Wty	145
Seagate 160GB 7200rpm 8MB, 3yr Wty, NCQ	170
Seagate 200GB 7200rpm 8MB, 3yr Wty	200
Western Digital 36GB 10000rpm 8MB, 5yr Wty	165
Western Digital 74GB 10000rpm 8MB, 5yr Wty	285

DVD Writers

Sony DRU710A 16x Dual Layer Drive	170
Pioneer DVR108D 16x Dual Layer Drive	135
Pioneer A08XL 16x Dual Layer Drive	170
LG GSA-4160B 16x Dual Layer Drive	120
Sony DW-D22A 16x Dual Layer Drive	120

LCD Flat Panel Displays For Gaming

Samsung 710N 17" (500:1,12ms, 3yr)	650
Samsung 172X 17" (500:1, 12ms, 3yr)	800
CMV 720D 17" (500:1, 8ms, 3yr)	500
BenQ FP767 17" (500:1,12ms, 3yr)	560
BenQ FP937 19" (500:1, 12ms, 3yr)	730
BenQ FP2091 20" (500:1, 14ms, 3yr)	1485

Shuttle XPC Barebones Kit

SN85G4 v2 nForce3 Athlon64 S478 Barebones	475
SN95G5 nForce3 Athlon64 S939 Barebones	510
SB83G5 i915P Pentium 4 LGA775 Barebones	545
SB81P i915P Pentium 4 LGA775 Barebones	645
SB95P i925X Pentium 4 LGA775 Barebones	675

Motherboards for Athlon 64

Gigabyte GA-K8NS Pro nForce3 250 Motherboard	185
Gigabyte GA-K8NS Ultra nForce3 250 Motherboard	195
Abit KV8 Pro K8T800 Pro Motherboard	180
ASUS A8V Deluxe K8T800 Pro Motherboard	225

Motherboards for Pentium 4

Abit AG8-3rd Eye i915P Motherboard	258
ASUS P5GD2 Deluxe i915P Motherboard w/ Wifi	359
Abit AA8-3rd Eye I925X Motherboard	303

Video Graphic Cards

Leadtek nVidia 6600 128MB PCIx16 Card	270
Albatron nVidia 6600 128MB PCIx16 Card	225
Albatron nVidia 6600GT 128MB PCIx16 Card	345
Albatron nVidia 6600GT 128MB AGP8x Card	380
Gainward GS nVidia 6600GT 128MB PCIx16 Card	395
Gainward GS nVidia 6600GT 128MB AGP8x Card	420
Albatron nVidia 6800 GT 256MB AGP Card	675
Gainward GS nVidia 6800 GT 256MB AGP Card	780
Gainward nVidia 6800 Ultra 256MB AGP Card	850

Cases

CoolerMaster Cavalier 1 Tower Case w/ 350W	175
CoolerMaster Cavalier 2 Desktop Case w/ 350W	155
CoolerMaster Cavalier 3 Tower Case w/ 350W	155
CoolerMaster Cavalier 4 Desktop Case w/ 350W	140
CoolerMaster Centurion 5 Tower Case w/ 350W	140
CoolerMaster Praetorian ALU Tower Case no PSU	169
CoolerMaster WaveMaster Tower Case no PSU	228
CoolerMaster Stacker Tower Case no PSU	230

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Hotbox

Alien's Conspiracy

Technical details

- AMD Athlon XP 2400+ @ 2.4GHz
- Gigabyte GA-7S748
- GeForce FX 5600 @ 310/520
- 256MB DDR400 Kingston RAM
- 40GB ATA133
- Creative SoundBlaster Live!
- Creative CD-RW
- Aerogate II
- Liquid neon
- Rounded cables
- Two 120mm fans
- One 80mm

Being in a stealthy mood that day I decided to make a stealthy case. I stripped the case down to the chassis. Cutting the Angel on to the mobo tray was arduous, but after an entire day the job was eventually done. Next I found some sheet metal in the garage and got to work cutting it to size and sanding it down to a shiny finish. Two blue LED's light up the Angel and rear of the mobo to show off its circuitry. A liquid neon lights up the interior with a groovy effect. I used the hidden fan mod from the Heavy Water Project for the top fan. What makes it stealthy is that during the day I can still put the side panels on and the box looks like a normal beige box. But during the night off come the side panels and the Conspiracy is revealed. LAN box or just a normal case? The Conspiracy can be both.

Greg's eTrix eVo1

Technical details

- ASUS P4SGL-VM
- Intel Pentium 4 2.4GHz @ 2.98GHz
- 1GB RAM
- 128MB Integrated on board
- Onyx DVD-ROM imported household tray integrated into first drive bay
- LG 52x24x52x CDROM/burner
- Seagate 80GB HDD
- Seagate 40GB HDD

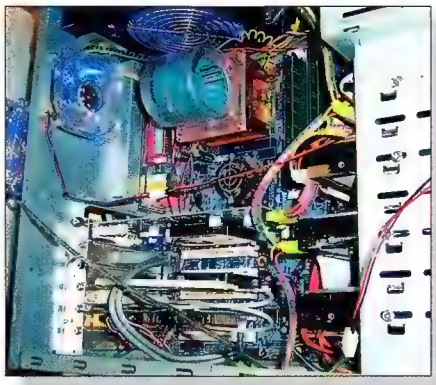
Heavily modified Macase, rear cooling fan grille drilled out and LED fan and Bio Grille installed, the PSU has also had a chop with all non-essential cabling removed and Green LED fan installed. The front of the PSU houses a Tri-Color LED fan with a custommade 4mm perspex grille.

The Interior is sprayed in a Holden Monaro Piano Black and all cables have been hidden as much as possible with green conduit covering. The system also uses an old 486 LCD display, re-tweaked to say 'P4' :)

The front green LED fan has a custom made bio-hazard grille made from 5mm perspex. The front clear button houses one UV purple LED and one clear RED LED which, when lit, together give a wave effect through the buttons. An interior glow is created by using a single CCFL and the case also has self-made Blue LED feet.

This PC was originally showcased at the 2003 World Cyber Games (PC Modding Comp) and was also shown at BaiLAN 2004.

Kommando's Curie



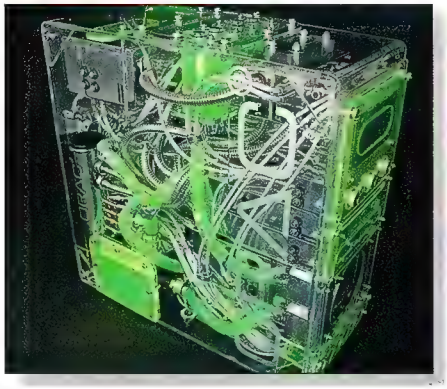
Technical details

- AMD Athlon XP 2400+ @ 2.18GHz
- CoolerMaster Aero7+
- Gigabyte GA-7N400 Pro2
- 1GB PC3200 (dual-channel)
- ELSA GeForce 5900XT 256MB
- Creative SoundBlaster Live! Value
- Seagate 80GB SATA w/ 8MB cache
- Western Digital 200GB w/ 8MB cache
- LG DVD-ROM
- GTR 450W dual fan PSU
- Fanbus and CardCooler
- Slide-up carry handle
- Paint job and LAN scars

I picked up the case for Curie from a dodgy pc store for $20. Black and missing the front bezel, I set out to turn it into a respectable hardcore gaming rig with the whole pc themed blue and silver. With time, effort and much spray paint, Curie started to stand out from the crowd sporting a blue and silver monitor and keyboard to match the case. The window was provided by John at Umart who took every effort to find it for me. Next came the 'Crowy mod' which involved mounting a slim fan over the back of the CPU socket under the side panel. The handle is courtesy of JayCar and was added to assist in carting this heavy steel box to LANs.

Fully decked out with blue fans, a uniform paint job, sheathed optical drives, killer looks, stickers and the noise of a jumbo taking off, Curie never fails to pull a comment at LANs.

G-gnome's Orac³



Technical details

- Intel Pentium 4 3.0GHz
- ABIT IC7-G Max motherboard
- 1GB Corsair PC3200 TwinX RAM
- 4x Seagate 80GB SATA (RAID 0+1)
- Sapphire RADEON 9800 PRO
- Creative Audigy 2
- Antec True Power 550W PSU
- Danger Den Maze3 CPU and NB waterblocks, Maze4 GPU WBlock
- Eheim 1250 Pump
- ½in ID Tygon Tubing
- Black Ice Xtreme chrome radiator
- 2x Criticool water reservoirs
- Criticool PCI pump relay card
- Promise 4x SATA RAID card
- Pioneer slot-loading DVD drive
- Matrix Orbital 20x4 VFD display

The inspiration behind this mod came from the computer Orac, out of the old sci-fi series Blakes-7. Besides the case, every internal component was extensively modded inside and out over a nine month period and I stuck strictly to the themes of chrome, stainless steel, neon green and transparent Perspex. The goal was to ensure nothing inside the case looked anything like an ordinary computer.

I chromed or built chrome covers for everything, including the motherboard and PCI cards. I built two chrome junction boxes to extend the PSU and ran all of the cables inside 15m of steel shower hoses (including using the screw fittings) and 20m of aquarium tubing, with 50 chrome jack plugs to patch power to everything. Over 400 stainless fasteners were used in the build, plus a lot of neon green Perspex! I paid a lot of attention to the small details, even down to things like custommade, backlit DVD buttons and case feet.

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- AGP 8X
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- NVIDIA Firewall, NVRAID

NVIDIA nFORCE 3

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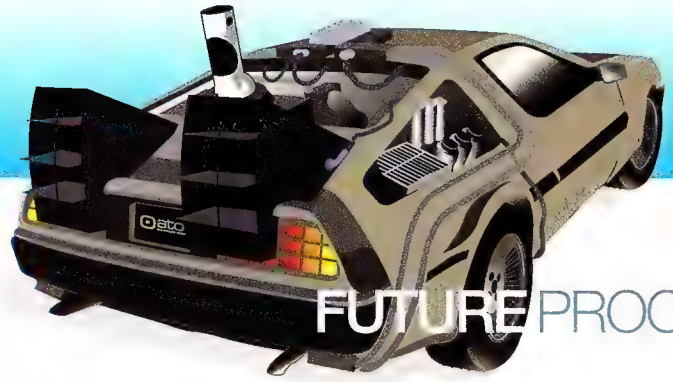
Basil Fawlty



FUTURE PROOF

Outing Cell

John Gillooly gets ready for Sony's hardware barrage.

It has been the subject of all kinds of consumer electronics led utopian visions, but until recently little has been known about the mysterious Cell processor being developed by Sony, Toshiba and IBM. Envisioned as the mainstream arrival of massively parallel processing, Cell is the brains of the as yet unannounced PlayStation 3 as well as the hardware to power Sony's next generation consumer electronics device.

While the full details of the architecture will be unveiled in early February at the International Solid State Circuits Conference, the first real details have now been released by Sony, Toshiba and IBM. Unsurprisingly the Cell architecture is based around IBM's 64-bit Power PC processing core; however Cell incorporates multiple cores onto the one die for highly parallel processing.

This allows the Cell processor to perform such tricks as running multiple operating systems at the same time, which is enabled by high bandwidth connections between the cores. This contrasts with one of the much talked about but little thought out features of Cell: its ability to draw on other idle processors on a network, be it local or over the internet, for extra processing grunt. The bandwidth and latency disparity between on die local interfaces and Ethernet/broadband links is so high that it is unlikely that the sort of tasks that Cell will undertake will be suitable to do on other systems.

One expects that the first clarification on this functionality will come when the tipped unveiling of the PlayStation 3 happens at this year's E3 in May. This will be the second appearance of Cell. IBM and Sony have also announced that they have powered up the first Cell based workstation, designed for digital content creation, and these should appear on the market before PlayStation 3.

The workstation first strategy makes sense, as there is serious concern in the game development community that the distributed architecture of Cell will be an absolute nightmare to code for, requiring a whole new way of thinking to ensure all processor cores are equally fed. A Cell workstation can happily act as a dev box for PlayStation 3 as well as for high end digital animation and other similar tasks.

Cell processors themselves have been designed using IBM's 90nm Silicon on Insulator technology, and made in the troubled East Fishkill fabrication plant. The first processors will be made in the first half of this year and go into the workstation product. Besides PlayStation 3, both Sony and Toshiba plan to incorporate Cell into HDTV products scheduled to launch in 2006.

Microsoft's Xbox successor will also be using a Power PC based architecture and although it is tipped to use multiple cores, it will be different to Cell. There are some distinct differences between the details that have been leaked on the two approaches: Microsoft through its XNA initiative is going hardcore on the ease of development angle, and this is further supported by rumours of load balanced shading units for the graphics side of things, which takes a lot of developer angst out of the picture.

While the battle for the next generation of consoles is well and truly underway, the all important launch titles will probably bear the scars of the development process. If Sony can make Cell easy to code for then it could well solidify its lead in the market, if Cell programming is as nightmarish as people predict, then the tables could well turn on Sony's ambitious plans.

ShortCircuits

Recent advances in nanotechnology have opened the door on computer displays that make good use of diamond dust. Called 'nanodiamonds', these minuscule jewels emit electrons better than any other known substance – which makes them incredibly efficient at transmitting electricity. The flexible nature of nanodiamonds also allows for the construction of displays in a variety of sizes and shapes. And the best part of all – it's all on the cheap.

Researchers at Toshiba have come up with a way of making quantum cryptography work, according to UK newspaper *The Observer*. Until now, quantum cryptography has been problematic thanks to the fickle, sensitive nature of photons: the smallest change in operating conditions can corrupt the data they carry. Toshiba, in recent tests using its techniques, has transferred encrypted quantum data flawlessly for periods spanning up to a week.

Rumours of the demise of NVIDIA's NV48 have been greatly exaggerated, according to numerous online sources. The high-end chip, destined to compete against ATI's R520, will be manufactured on a .11-micron process at TSMC in Taiwan. This latest news installment comes hot on the heels of the company's recent announcement that it has inked a deal with Sony. That venture will see the company develop the graphics chip for the PlayStation 3.

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Game to watch

With Nintendo going after the mature handheld gaming market John Gillooly takes a look at its new dual screen wonder.

As Microsoft and Sony have taken the console battle high tech, Nintendo has always stood as a throwback to a simpler time. It staunchly maintains that it is a toy company, not an electronics one, and has stayed away from premature online moves and the near wholesale shift to mature games titles.

After announcing it would target more mature gamers at E3 2003, Nintendo has now launched its first product targeted at the older audience. The Nintendo DS is a dual screen handheld gaming system that is supposed to revolutionise gaming as we know it, thanks to the inclusion of a touchscreen to be used for game control.

It is not supposed to be a competitor to the dominant handheld gaming platform, the Gameboy, instead it is designed to compliment and extend the dominance to the 20-something gaming market. Its main competition will be Sony's PlayStation Portable, which has lost some of its lustre since it was first announced. There are worries that the PSP will suffer from painfully short battery life, and the product looks like it will be in incredibly short supply at launch.

So many cores

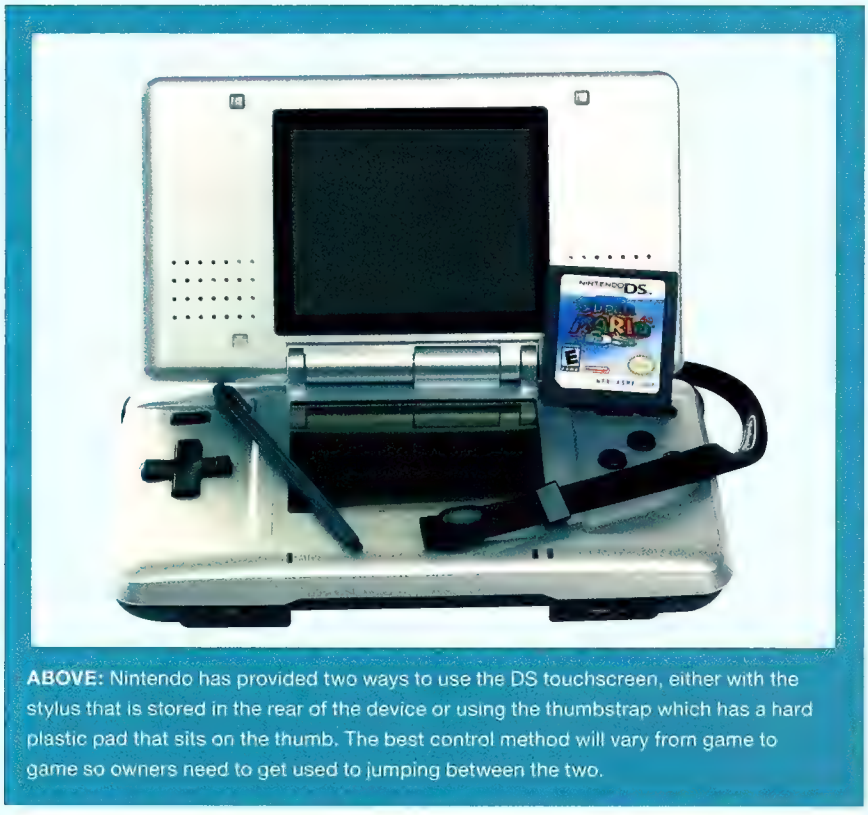
Nintendo like to focus on the games rather than the technology, but the Nintendo DS is still pretty impressive from a hardware standpoint. It is built around two CPUs, the main one is an ARM946E-S core running at 67MHz, and the secondary is an ARM7TDMI at 33MHz. The ARM9 CPU appears to control the games themselves, while the ARM7 is used to run the touchscreen, wireless communication and audio. Each CPU has 16KB of dedicated memory.

Graphics display is handled by three separate units. There are two 2D graphics cores, one for each screen. These chips are similar to those used in the Gameboy. There is also a single 3D graphics core. This means that 3D graphics can only be displayed on one of the screens, but developers are able to choose which screen this will be. This 3D chip is similar in power to that used to power the Nintendo 64.

Both of the screens on the DS are identical 256x192 18-bit colour LCD screens. Made by Sharp, these can display 262,144 colours. The lower screen is the touchscreen, and this can be operated both by a stylus and a strap on plastic thumb pad that ships with the DS.

For the first time since the failed Virtual Boy, Nintendo has included stereo sound on the DS. Driven by the ARM7 coprocessor, the hardware is capable of 16 channel audio. Also built into the DS is a microphone that can be used to control games or even communicate with other nearby DS owners.

One of the revolutionary aspects of the DS revolves around its networking hardware. Running both 802.11 (rumours are pointing to it being 802.11B) and a custom Nintendo protocol, the DS has been designed to be networkable. It ships with an inbuilt program called Pictochat, which is an instant messaging program through which you can communicate with other DS owners. It even supports wake on wireless LAN, so the DS will be able to notify you if you are messaged when it is closed. Games like Super Mario DS also come with the ability for other users to multiplay without a cartridge in their handhelds by downloading the game from a nearby user.



ABOVE: Nintendo has provided two ways to use the DS touchscreen, either with the stylus that is stored in the rear of the device or using the thumbstrap which has a hard plastic pad that sits on the thumb. The best control method will vary from game to game so owners need to get used to jumping between the two.

The wireless functionality opens up new doors for Nintendo, with talk pre-launch ranging from the potential for voice-over IP applications using ad-hoc DS networks, to the ability to download game demos and other content over the internet. It is still unconfirmed whether the DS will be able to talk to PCs.

Chunky is not a dirty word

Tech specs are one thing, but a device as unique as the DS really doesn't become

clear until you get one in your hands. It is big, dwarfing the svelte Gameboy advance SP design and teetering right on the unwieldy edge of being 'pocket sized'. This is not really a disadvantage as Sony's PSP will be of a similarly large size. Its clamshell design reeks of sturdiness, and when closed only the shoulder buttons remain exposed. DS games plug into the rear of the unit, while the front sports a slot for GameBoy Advance cartridges, which it is backwards compatible with. It uses the same battery charger as the GBA, which plugs in next to the DS cartridge slot on the back.

When opened the unit has stereo speakers and the normal LCD screen on the lid of the clamshell. The second screen is directly under the first, however the large hinge is in between the two, which limits the ability for developers to split an image across both screens. It doesn't become too much of an issue though, and mini-games that use both screens work just fine.

On the left of the main body is a digital directional pad. There has been much debate over Nintendo's choice of digital rather than analog, something it has tried to remedy by promoting the touchscreen as an analog control option. The right hand side has four buttons, up from the GBA's two. Rounding this out are two shoulder buttons for additional control.

Despite the large number of buttons on the DS, control largely revolves around the touchscreen. Nintendo offers two options for control out of the box. The first is with a PDA type stylus that sits snugly in the back of the DS, and the second is with a strap that can be attached to the unit. The end of this strap fits around the thumb and has a plastic pad that can then be used on the touchscreen. These two options both have advantages and DS owners will most likely end up switching between the two depending on the games being played.

ABOVE: As usual Nintendo has chosen a solid state memory card for its DS games. The card is much smaller than a Gameboy cartridge. DS games slot into the back of the DS, while Gameboy games slot into the front.

Stick it to them

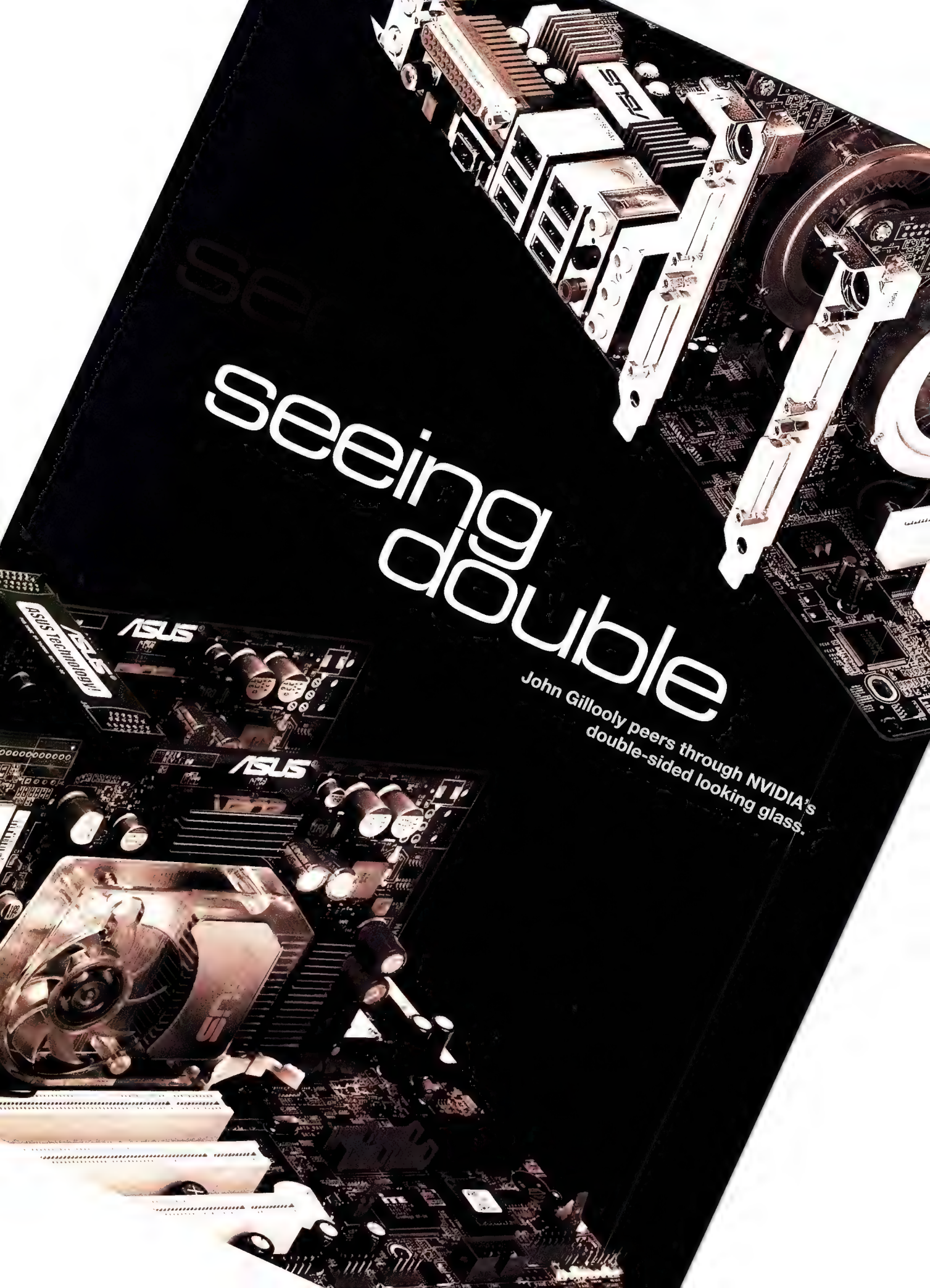
We tested the DS out with the Metroid Prime: Hunters demo that ships with the handheld and also the flagship Super Mario DS. Both use the touchscreen for interaction, but in very different ways.

Hunters is a first person shooter using the touchscreen for aiming. While initially fiddly to control, this soon becomes smooth, with the d-pad used for movement, touchscreen to aim and shoulder buttons to shoot. It's not perfect, but it's certainly fun.

Super Mario DS is a much stranger beast. Essentially it is a remake of Super Mario 64, with some small storyline changes and a pile of touchscreen focused mini-games. It uses the touchscreen to replicate an analog stick, but while the control is functional it never feels quite right. You can still control the game using the d-pad and buttons to toggle sneaking or running, but overall the experience isn't a great one.

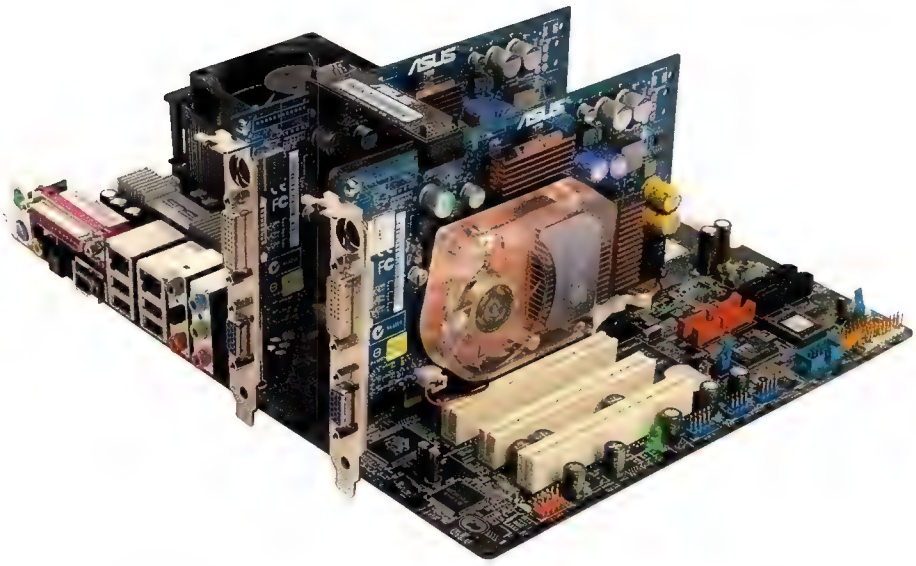
However the mini-games in Super Mario DS are well worth the price of admission. Unlocked as you play through the main game, these make full use of the touchscreen and provide a good indication of what Nintendo is trying to do with the DS. Games range from using the stylus to lob cannonballs at incoming bombs, to cards games and puzzles. These are time suckers extraordinaire and work exceptionally well with the touchscreen controls.

Nintendo has launched the DS in both America and Japan and plans to launch it in Australia during the first quarter of this year. The launch title line-up in the states has been criticised for the lack of a killer title, thankfully by the time that the DS gets to Australia the line-up of games will have expanded and this should lead to a much stronger launch. Local pricing and precise dates are not known, but it has been selling for US$150 with games at US$30.



seeing double

John Gillooly peers through NVIDIA's double-sided looking glass.



When NVIDIA blindsided the graphics market and announced the long, long awaited return of a dual video card solution the world had two questions. How fast and when? The answers were simple. 80 percent and a cry of 'look behind you! A three headed monkey' as they ran away.

Well SLI is now here and it is indeed as gloriously sexy as we all imagined it would be. But it's also buggy to a similar degree. Not terminally buggy mind you, more BIOS and driver fixable buggy. Every single component in our testbench needed to be swapped, motherboard and video card included, before we got it running. And even then things were far from clear sailing – and by that we mean viewing.

What we have garnered is a picture of what performance can be promised once SLI is running smoothly. It really is something special, and the sight of two identical graphics cards gobbling up all that expansion space is enough to make any grown geek drool. Installation is always going to be initially fiddly as you switch around the SODIMM card that swaps the board between one x16 PCI-Slot and two x8 PCI-E ones. But even that is fun in its own special way.

So will be the way with the first nForce4 SLI boards from the big players, ASUS, MSI and Gigabyte. Then we should see some attempts at BIOS based switching by other players, and a rapid transition by all to such a product soon after.

If you want to go dual video card for now you'll need the following: One socket 939 Athlon 64 CPU. It doesn't need to be extravagant; our testing with an Athlon 64 3500+ yielded great results. Intel CPUs should get support when NVIDIA lifts the lid on its Pentium 4 chipset sometime in the future.

You'll also need an nForce4 SLI board for now. No-one else will try until they see how successful the experiment is. What most people will do for now is get a board and a single card, be it a GeForce 6600GT or 6800GT, then get a second card a few months down the track. 6600GTs are common enough, while 6800GTs are currently rare, they should flood the market soon. And no, you currently cannot mismatch brands or models of cards. We tried. Hopefully some bright spark will develop a BIOS or Driver hack for some warranty voiding experiments. Not that we at *Atomic* condone these sorts of things, of course!

Seeing as SLI is being positioned as a premium product, expect to pay top dollar for SLI capable motherboards. It does get you more features than you would have ever conceived of needing, including NVIDIA's hardware/software firewall combo and the nifty nTune overclocking and performance monitoring program. If demand is high enough or a competitor enters the market, expect prices to drop, and a marketing war to begin. But that's another story.

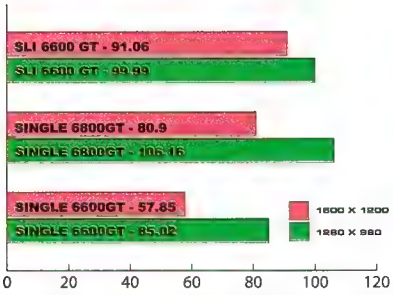
Scalable Link Interface

Our adventures with SLI began thanks to an ASUS A8N-SLI Deluxe board and a pair of ASUS GeForce 6600GT cards. For those who were wondering, the dongle to join the two cards comes with the motherboard, not the graphics cards as NVIDIA first stated. It's to do with slight tolerances in motherboard design. Expect some crazy attempts by mobo makers at engineering to make this BIOS based as well.

ASUS are releasing regular BIOS updates, which are improving compatibility at each step. While this means vigilant watching of the ASUS ftp for board owners, it does mean that issues are soon sorted. Consider our testing only a preview of performance, by the time you build your own SLI beastie you'll most likely find much improved performance.

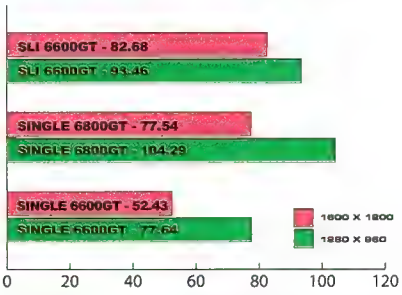
We tested using the ASUS board and cards as well as 512MB of OCZ memory (recommended by ASUS for compatibility) and 36GB WD Raptor hard drives. We were using Antec EPS 550Watt server power supplies to power the testbenches to ensure enough juice and to connect to the 24-pin power supply connector on the board (now a feature on pretty much all new motherboards due to the needs of PCI-Express). Because the second graphics card also needs juice, ASUS has mounted a four pin molex connector on the board near the first card which needs to be connected for SLI to operate.

FAR CRY - BUNKER DEMO



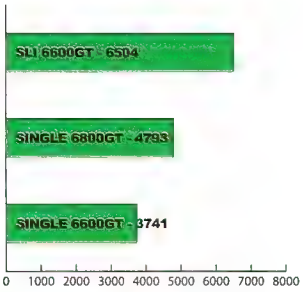
AVERAGE FRAMES PER SECOND

FAR CRY - TREEHOUSE DEMO



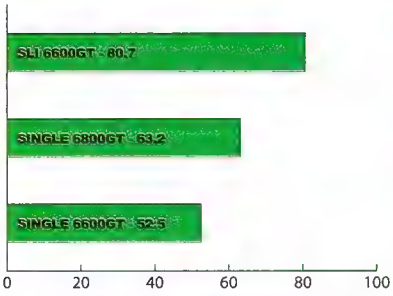
AVERAGE FRAMES PER SECOND

3DMARK 05



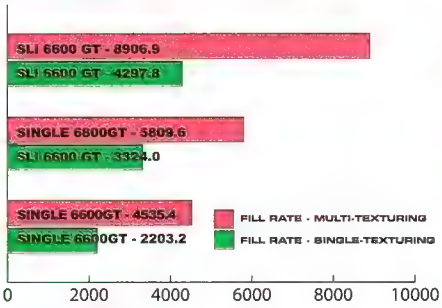
3DMARK

DOOM 3 - 1600 X 1200 HIGH QUALITY



AVERAGE FRAMES PER SECOND

3DMARKS05 FILL RATE



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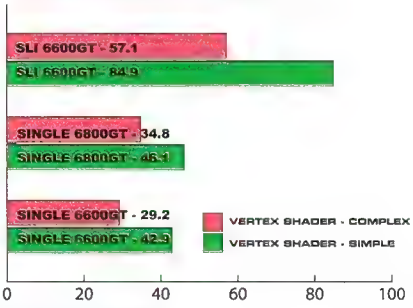
VERTEX SHADER TESTS



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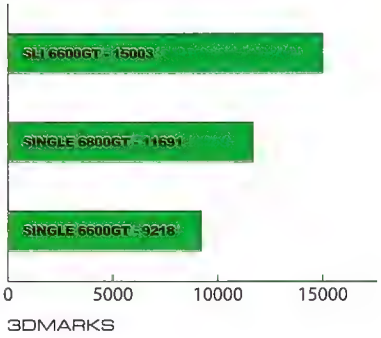
3DMARK03 SCORE



3DMARKS

PCI-Express GeForce 6800GT cards were at the time of writing currently in short supply, so unfortunately we couldn't bring you the really damn speedy results expected from them. We did have one Sparkle 6800GT that we used for a comparison to the two 6600GT cards. Finally tests were run with a single 6600GT card.

Our expectations were that the two 6600GT cards would be a touch slower than a single GeForce 6800GT. 6600GT cards have eight pipelines but only a 128-bit memory bus. The 6800GT meanwhile has sixteen pipelines and a 256-bit memory bus.

Our results show that to be the case in some applications but untrue in others. In the two 3DMark versions and Doom 3 the SLI 6600GT cards come well ahead of the 6800 GT. Still not double the performance of a single 6600GT, but damn good for two mainstream cards.

In Far Cry our expectations were met as the SLI setup nestled neatly between the two others in performance. It was still damn good for what is a very shader intensive game.

We also tested with SPECViweperf to see whether there was a boost to be seen. We haven't included the results because there are a lot of them and they are perfectly identical. Changes should be seen when NVIDIA lifts the lid on SLI Quadro cards.

While the performance boosts in 3DMark were grand, both versions of the benchmark were scarred badly with artefacts during the runs. We include the results with this big proviso. Only Doom 3 was stable, indicating that Direct3D driver issues still exist.

We suspect the performance boost could in part be due to the doubling of vertex shaders. We have included some data from the extra tests in 3DMark05 to show the effect that doubling the vertex shaders has on performance. This should bode well for Geometry Instanced games in the future.

Overall our experience with SLI was a mixed blessing. We can certainly see where things are going, and it's one of the most exciting hardware development in years. Better yet, it's a great upgrade path, with single cards work fine in the nForce4 SLI boards and the ability to upgrade to SLI when you're ready.

	SLI 6600GT	single 6600GT	single 6800GT
VGA Memory Clock	1170MHz	585MHz	232MHz
VGA Core Clock	585MHz	293MHz	50MHz
Total Physical Memory	512MB	512MB	512MB

The Imagine Cup

Last year it was the frogs that took home the prize. A team of four French university students built a home automation system, based on the Microsoft .NET Framework, allowing users to control house functions, monitor energy consumption and watch security cameras from a PC or Pocket PC. For their trouble, they pocketed US$25,000 in prize money. The second prize, of US$15,000, went to four Russian students who developed a learning tool designed to get students more involved in eduction by using role-based games as a teaching tool. Australia wasn't left out either, with the Australian team winning an expenses-paid trip to Brazil and the opportunity to demonstrate their work at Microsoft Tech-Ed in Canberra (also paid for).

The Imagine Cup is running into its third year now, with more students and more countries than ever expected to compete. It's a worldwide competition, organised and funded by Microsoft, to find the most creative students in the field of technology. Students from both high school and university are eligible to compete, and the national winners will get an all expenses paid trip to Japan in August to represent their countries against the rest of the world.

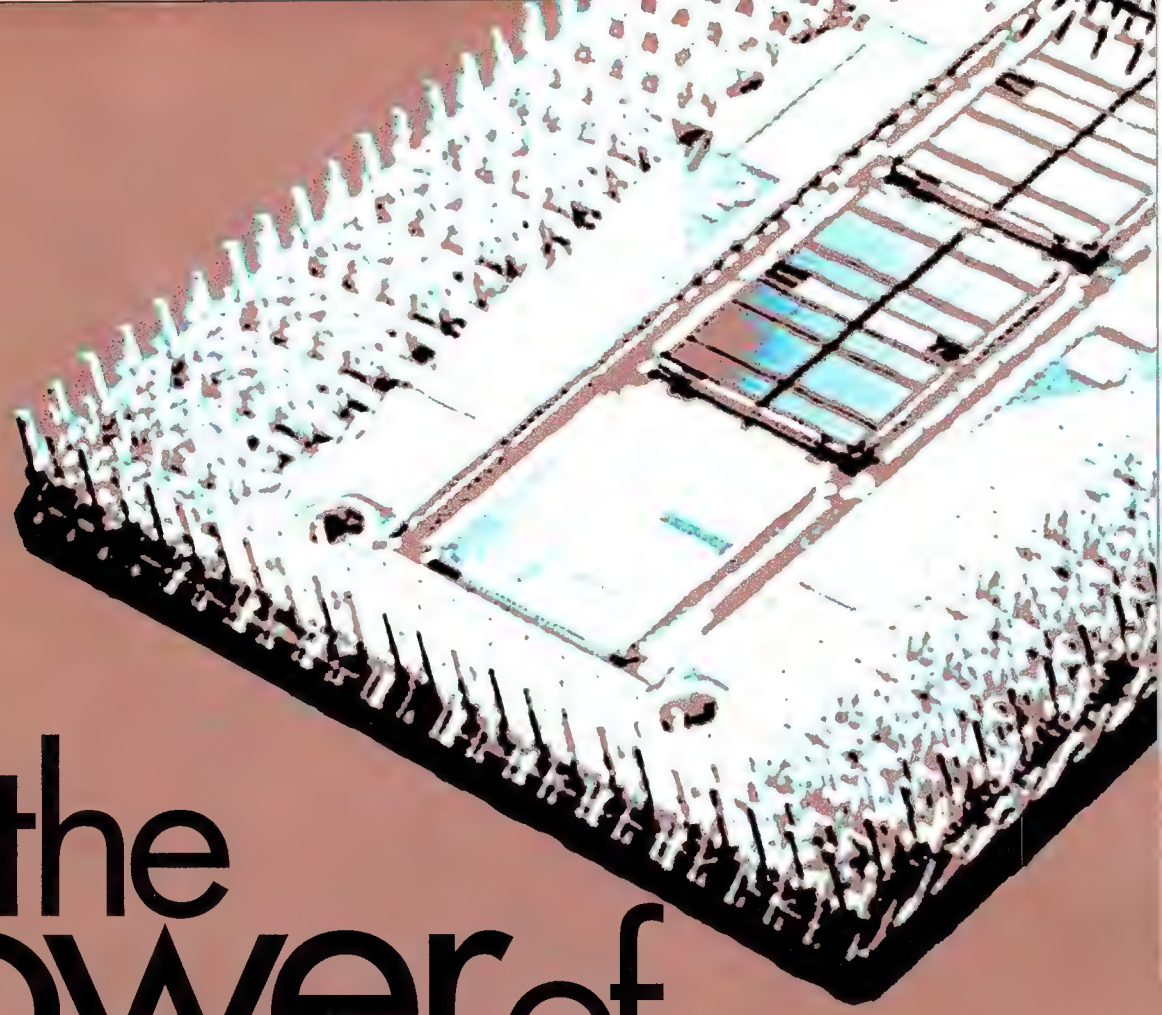
According to Microsoft DPE Academic Marketing Manager Pradeepa de Silva, over 500 students from Australia and New Zealand are expected to compete this year. Last year, over 10,000 students worldwide competed.

Each year there is a theme for the competition, and this year's theme is "dissolving the boundaries between us." There are nine categories of competition, with separate prizes for each, and a total prize pool of US$215,000. The biggest and most rewarding category is the Software Design category, in which Students are asked to build a solution that can address the theme of the contest which is 'imagine a world where technology dissolves the boundaries between us. The solution has to be built on the .NET platform.

If you're no programming whiz, there's still plenty of opportunity to enter in creative categories, such and the Short Film category or the Technology Business Plan. Entries for all the categories except Software Design will close in the March-April timeframe. Software Design entries need to be submitted by May. If you're a student and are interested in signing up, take a trip to www.imaginecupasia.com students can also receive information straight to their inbox by sending a SMS to 0409 459 014 email address in the body.

The categories

- **Software Design** *for .NET and the Windows platform.*
- **Office Designer,** *which involves building a solution for Office that provides practical productivity gains.*
- **Algorithm,** *which is a competition to solve a set of brain teasers and find algorithmic solutions to given problems.*
- **Short Film,** *based on the theme of the competion, "the boundaries between us".*
- **Technology Business Plan,** *formulating a business model that uses technology to facilitate communications.*
- **Rendering,** *in which the contestants tell a story in 3D.*
- **IT,** *a category in which the contestants demonstrate their knowledge of the science of networks, servers and analysis.*
- **Web Development** *where prizes are awarded for the creation of educational Web sites using ASP.NET.*
- **Visual Gaming,** *the development of a strategy for a multi-player game.*



the power of two

Single core CPUs as we know them are dead. James Wang investigates the coming revolution of dual-core CPUs and whether Intel will be able to stay ahead of the pack.

It is hard to overstate the significance of Intel's new direction. It was the central theme of last year's Intel Developer Forum. It's why Craig Barrett, Intel's CEO, went down to his knees to apologise. And it's why Pat Gelsinger, Intel's CTO, is preparing us for growth that's faster than Moore's Law - Intel is getting off the GHz gravy train for good and concentrating its energies on multi-core processors.

To understand this change, one must be able to appreciate how the Pentium processor has evolved. We'll start off by briefing you on Intel's past and present and the reasons why frequency has hit a brick wall. Then we'll outline what you're likely to see in the coming years for processors and PCs.

Moore growth

CPU performance growth has previously been measured by Moore's Law – that transistor counts double every 12 to 18 months. However, Moore's Law says nothing about performance – it is mostly about transistor density at a given price point. To increase performance, the extra transistors must be put to effective use.

Intel has an excellent track record of putting transistors to good use. The company introduced one of the first 16-bit CPUs in 1987 with the 8086. With the 386, Intel once again doubled the word size, this time to 32-bits, at a substantial transistor cost. Their next chip, the 486, was an enormous improvement on its predecessor by any measure. It introduced pipelined execution to Intel processors. Previously CPUs couldn't walk and chew gum at the same time – they needed the previous instruction to exit the pipeline before fetching the next. The 486 fetches instructions irrespective of whether the previous is complete. This allowed overlapped execution of instructions and resulted in a substantial increase in throughput. Using the additional transistors afforded by Moore's Law, the floating point unit (FPU), which until now was an optional add-on, was also integrated onto the CPU. These improvements together with integrated cache give rise to performance that allowed graphical user interfaces to be usable on the PC.

...we'll present a case on why multi-core designs are the best bet, the traditional problems with multi-processors, and the solutions that we'll need.

The introduction of the Pentium gave birth to TV ads with bunny suits that showed the world just how jolly working at an Intel factory must be. The CPU itself earned the name because Intel was facing clone makers of its 486 CPUs. Since 586 is a number and numbers can't be trademarked, Intel dubbed its new chip 'Pentium'.

The Pentium used its transistor budget to make a major architectural advancement – a superscalar core. In the execution stage of the pipeline, the Pentium has two integer arithmetic logic units (ALU) instead of one as in all previous Intel designs. This allowed the CPU to do two integer operations per cycle. In the best case, a superscalar CPU can execute (depending on how many units work in parallel) multiple instructions per cycle (IPC), instead of multiple cycles per instruction (CPI). The inverse of the performance metric from CPI to IPC was brought by almost single-handedly by superscalar CPUs like the Pentium.

The Pentium Pro, introduced in 1995 brought some new and radical ideas that are not so easily understood. It's known as the P6 architecture, reflecting on the fact that it's Intel's sixth ground up design for the x86 instruction set. It incorporated many RISC architectural features as well as introducing multi-processor support. The Pentium II, III and M (aka Centrino) are all offsprings of the P6 core.

The Pentium Pro proved particularly scalable, reaching 1.4GHz (Tualatin) from the initial launch speed of 150MHz. Much of this is due to the 13-stage pipeline, significantly lengthened from the original Pentium's five stage design. By decoding complex x86 instructions into smaller internal instructions, the Pentium Pro's wider execution core allowed three instructions to be executed per cycle. Other major improvements came from better branch prediction, out of order and speculative execution. These optimisations are all geared at reducing hazard delays in pipelined execution. The bigger picture to see here is that these are no longer straightforward CPU optimisations but rather are optimisations of an existing optimisation, that of pipelined execution. In other words, the amount of performance increase to be gained is limited and in many ways, diminishing.

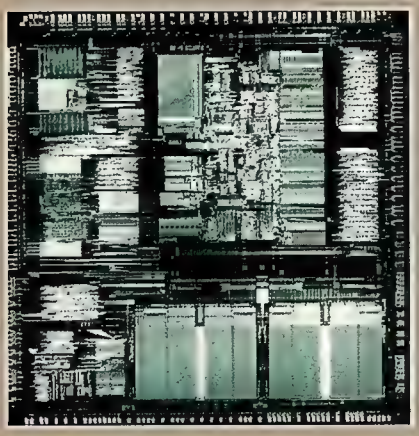
Despite the scalability of the P6 architecture, AMD beat Intel in the GHz race. This, among other factors shaped the design of the Pentium 4. Intel realised that people buy based on clock speed. If the number is bigger, it must be faster. In the consumer space, this was generally true – until the Pentium 4.

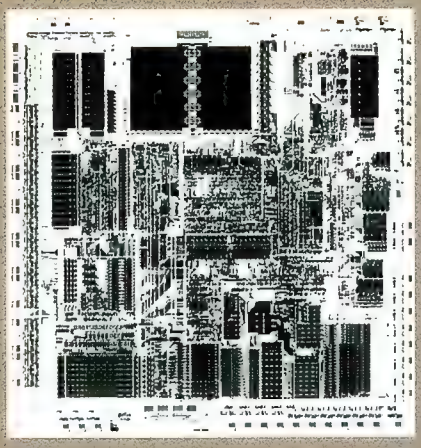
The Pentium 4 was built purely for clock speed. Instead of taking a balanced approach to improving clock speed and instructions executed per clock, the emphasis was almost entirely on frequency. The frequency of a chip is determined by the time it takes to execute the slowest stage of a pipeline. So if you can speed up the slowest part, you can clock the entire CPU higher. To achieve maximal frequency, Intel's designers made each stage as small as possible, thereby shortening the time it takes to execute each stage and increasing overall frequency.

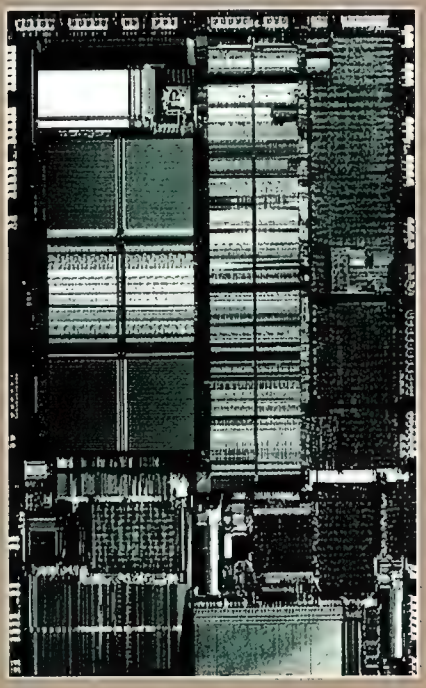
The first Pentium 4 (Willamette) featured a staggering 20 stage pipeline and the current version (Prescott) is at a ludicrous 31 stages. Unsurprisingly, the consumers bought the story. Despite AMD's best efforts, people were seduced by high clock speeds. Pentium 4 with its orgasmic 'Netburst' architecture sold like hot cakes while AMD's not so sexy 'Athlon' was left in the dust. That is, of course, until recently.

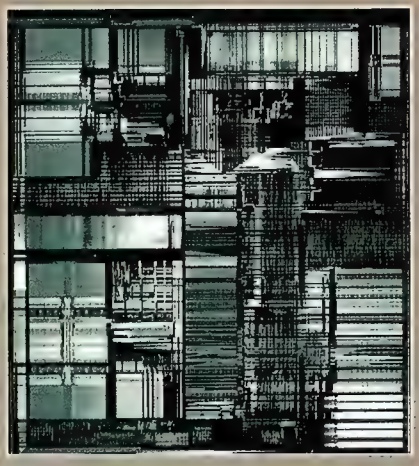
Since the Pentium 4 launched at the end of 2001, it's taken Intel about two years to ramp from 1.5GHz to 3.06GHz, an impressive two fold increase in clock speed. In the last two years, however, Intel managed to go from 3.06GHz to just 3.6GHz, a measly 17 percent increase. To make matters worse, the 4GHz version has been cancelled and Itanium is not ready for primetime. Clearly something is wrong with the Pentium 4.

The heat generated by a CPU is proportional to its frequency and die size. AMD's approach has been to choose a reasonable frequency and do more work per cycle. To achieve bigger numbers, Intel put most of its efforts on reaching maximal frequency. So for the same die size, the Pentium 4 runs hotter than its competitors. This isn't so much of a problem by itself. But since Athlon does more work per cycle, every









ABOVE AND RIGHT: The cores of the original 80286, 80386, 80486, and Pentium CPUs. A difference in transitor count ranging from 256 thousand to 16 million.

time the Athlon gets a speed boost, the Pentium 4 requires a larger speed boost to match. Due to the heat constraint, the Pentium 4's growth strategy has now become unsustainable.

Meltdown imminent

It's hard to exaggerate the seriousness of the power dissipation problem. A typical hot iron has a power density of 5W/cm2. The latest Pentium on the other hand dissipates a sizzling 91 W/cm2. In the year prior to Pentium 4's launch, Intel's Fred Pollack gave a presentation which plotted the power density of CPUs against other hot surfaces. Although Prescott couldn't be included, its actual position would only be a step away from a nuclear reactor. (Granted, the power density was plotted on a log scale, but CPU power density was shown be increasing exponentially.) Power density is easily the biggest problem facing the traditional application of Moore's Law.

Pollack's presentation conveyed the message that 'business as usual' – pumping up clock speed and increasing transistor density isn't going to work forever. The Pentium 4 proved his case. Although during the mid-life of the Pentium 4, it scaled exceptionally well and left AMD lagging, the last two years saw the Pentium 4 hit a thermal wall. A new direction is desperately needed.

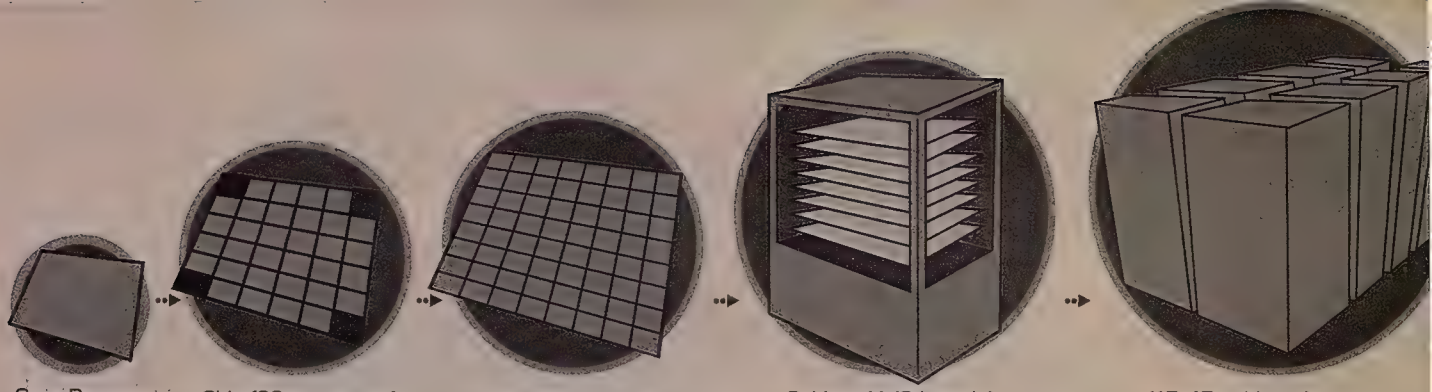
To make chips cooler, either clock speed or die size has to come down. The main motivation for increasing frequency has always been performance. But there are saner ways to boost performance. Instead of spending extra transistors on dragging the pipeline every longer and adding more cache to fight off memory latency – go for the opposite approach. Simplify the CPU and put two cores on a chip instead of one.

Multi-core CPUs elegantly solves the power density problem. If a pair of 1GHz CPUs occupy the same area as a large 2GHz CPU, they can offer comparable performance (for certain workloads) while being much cooler. In another 18 months or so, when transistor budget has doubled, you can repeat the trick and face no power problems. GPUs have been using this trick since they were born – they've gone from a single pipeline to sixteen pipelines. The latest GPUs are very much like four smaller GPUs but banged together.

The perils of multiprocessing

Multiprocessing is, of course, not without its problems. The biggest hindrance is dependency. The reason why we've yet to see ubiquitous multi-processor systems is due to the difficulty of chopping up arbitrary problems to run efficiently on multiple CPUs. This remains a big problem but with Intel's firm commitment behind multiprocessing, it's bound to change.

Intel has an excellent compiler division with decades of experience. Under their new direction, you can bet they'll be tweaking until every last ounce of execution time is used up on all CPUs. With better compilers, code written in higher level languages can be broken down and packaged in self contained units, allowing parallel execution. However, this mostly works at the instruction level – for thread level parallelism as in the case of multiple CPUs, it'll take some ingenuity from



Core Processor **1 Gigaflop** | Chip (32 processor) **32 Gigaflops** | Board (64 chips) **2 Teraflops** | Cabinet (4/8 boards) **16 Teraflops** | (15x15 cabinets) **1 Petaflop**

programmers to take advantage of the extra power.

Traditional parallel programming is very difficult – humans are just not made to think in parallel. However, there are classes of problems which are easily parallelisable. The next generation of PC applications will focus greatly on voice and image processing, both of which can benefit from multiprocessing.

Intel has done a ton of research in voice recognition, especially using multiple microphones. They believe six microphones may be required before computers can recognise voice as robustly as humans. If data from each microphone can be processed using threads, it would be a great application of multi-core CPUs. Facial recognition and image processing also offer data that's fairly independent in nature. Each pixel can be processed without waiting for the previous to finish, making them ideal to exploit multiple CPUs.

The case against multiprocessing has always been along the likes of 'multiprocessing is great but doesn't help with general purpose computing.' To which we ask – what is 'general purpose computing'? If its email and Excel, then you're right, it won't benefit. But why would it need to? Email and Excel already run as fast as they possibly can, who's to benefit from them going any faster? The fact is, 'general purpose computing' is a done and finished concept. The Pentium III suffices any general purpose computing. It's much more sensible to use future problems in judging the effectiveness of multiprocessing. For streaming data and image processing, multiprocessing certainly makes sense.

Multiprocessing is often seen just as using two processors. While this may be the case now, it's important not to lose sight of its true potential. When Gordon Moore published his famous paper in 1965, a typical chip used fifty components. However he saw the potential of ICs providing 65 000 components on a chip within ten years. A similar case can be made for multi-core CPUs. If Moore's Law holds for another ten years (as it's predicted to), then we can expect to see at least another six iterations of transistor doubling before we reach the limits of silicon. With no hickups, by 2015, hundreds of threads could run concurrently on a single chip. Whether this will actually happen will depend mostly on how warmly programmers embrace multi-threaded programming.

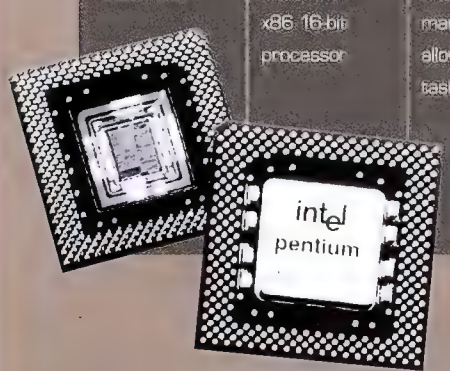
2005: the year of transition

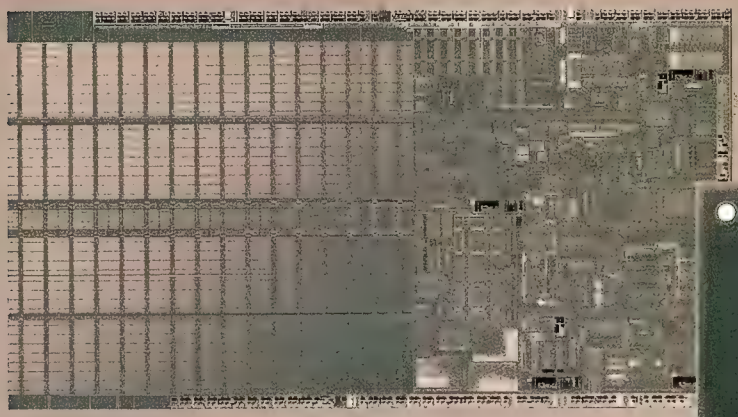
To show how late Intel is to the multi-core game, just take a glimpse at the competition. We'll look at three chips: Sun Microsystems' Niagara server chip, Sony's Cell processor and the Xenon CPU for the next Xbox.

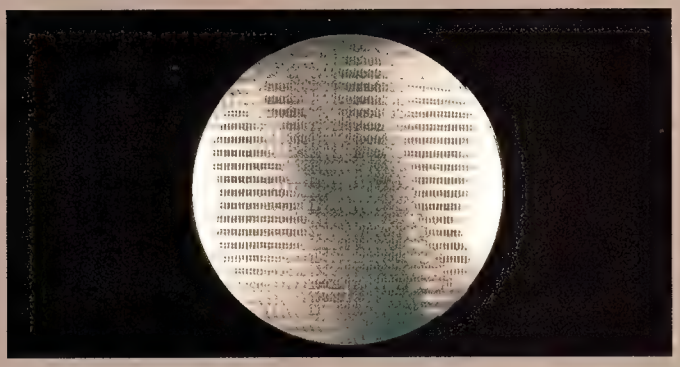
Sun's Niagara chip is not only multi-cored, but also multi-threaded. Each core supports four threads concurrently (compared to two on the Pentium 4) and each chip will have eight cores. That adds up to a 32-thread CPU – a beast of server chip by any measure.

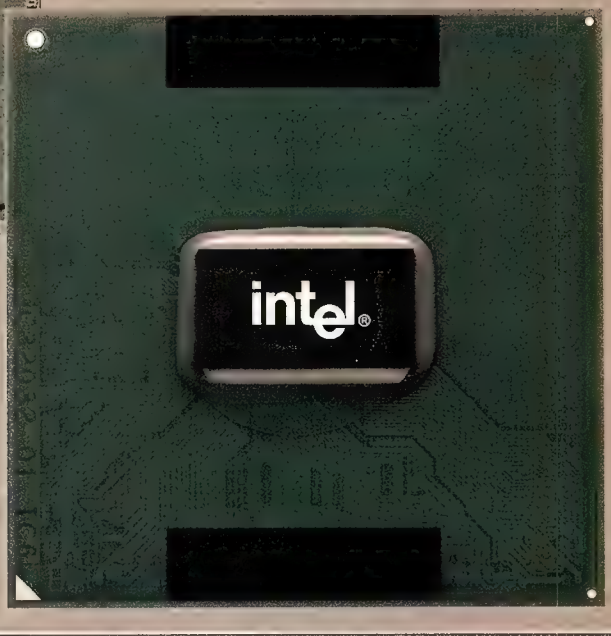
Niagara has lots of cores but not nearly as much cache. Each core has 24KB of L1 cache and the eight cores together share 3MB of L2 cache.

X86 CPU	8086	286	386	486	Pentium	Pentium Pro / P6 (II/III)	Pentium 4
Word-size	16-bit	16-bit	32-bit	32-bit	32-bit	32-bit	32-bit
Year of introduction	1978	1982	1986	1989	1993	1995	2000
Introductory Clock speed	4.77-10MHz	6-20MHz	16-33MHz	25-50MHz	60-233MHz	150-1400MHz	1.4-3.6GHz
Cache size	None	None	8KB	8-16KB	16-32KB	Up to 1MB	Up to 2MB
Comment	Intel's first x86 16-bit processor	Memory management allowing multi-tasking	Intel's first 32-bit processor	Intel's first Pipelined processor Integrated FPU Kick started GUI	2-way superscalar Branch prediction 64-bit memory data path	Multi-processor support 3-way superscalar OOE Speculative execution	20 stage pipeline Double pumped ALU Hyper threading in layer models







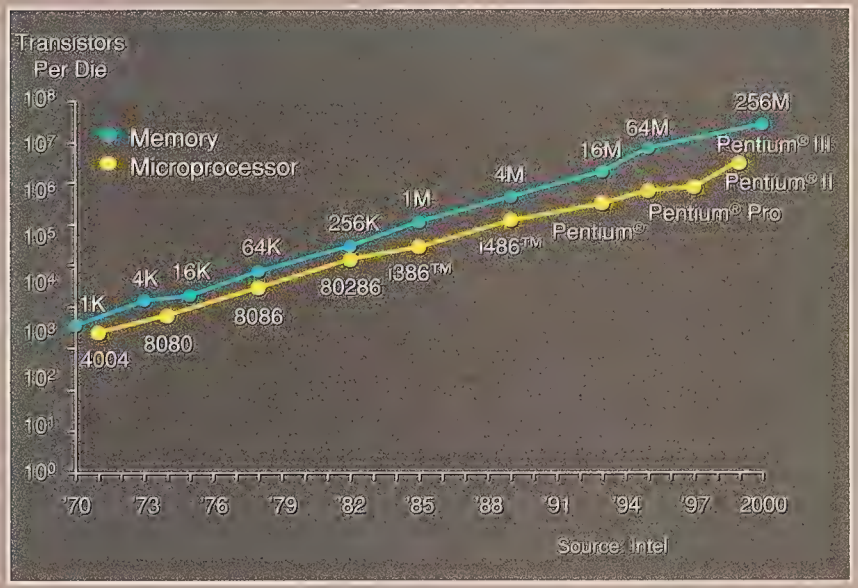


Left: Intel will abandon the Pentium 4 in favour of the Pentium M. Clockwise from left is a die shot of the cache-heavy mobile chip, the CPU and a wafer of 90nm cores.

Firstly, to make multi-core design feasible, each core should be as simple as possible. As it stands, the Pentium 4 is too bloated to be a good candidate.

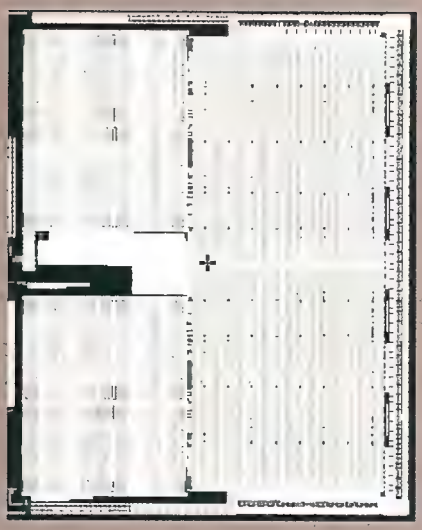
A huge benefit of multi-threaded CPUs is the ability to switch between threads if one suffers a cache miss. Whilst it takes a few cycles to retrieve data from cache, it takes hundreds of cycles to access memory. With a multi-threaded CPU like Niagara, if one thread doesn't find its needed data in the cache, the core can switch to another thread. Once the data is retrieved from memory, the thread continues as normal. With four threads to swap around, the CPU will rarely wait for work and the need for big blocks of cache is greatly reduced.

Below: Moores Law in action.



The 'Cell' processor is the brainchild of Sony, IBM and Toshiba. Their brightest engineers, from the creator of the Playstation to the architects of IBM's Power processor, jointly developed Cell. By the time you read this, the processor should have just been unveiled to the masses at the International Solid State Circuits Conference.

Like Sun's Niagara, Cell is multi-threaded and multi-core. It's also multi-chip. The Playstation 3 is expected to use two CELL based processors to reach an aggregate 1Teraflop of performance. If Intel continues down its present path, it'll require a 250 GHz Pentium 4 (using SSE) to hit the same mark, by which time its power density will have exceeded 6KW/cm2 – hotter than a nuclear reactor. Forget standard water cooling, you'll be needing Deuterium!



Left: AMD will be using the current AMD64 architecure for its dual-core solutions. Like multiprocessor Opteron systems dual core AMD chips will use a HyperTransport link to communicate with each other, and as this image shows each core will have dedicated cache on die.

Given all this, it's no wonder Microsoft has opted an IBM solution over an Intel one for the next Xbox, code named 'Xenon'. The Xenon CPU is also multi-threaded and multi-core. Three PowerPC cores are integrated on the same die and each runs two concurrent threads giving the system a total of six logical threads – not as beefy as Cell but light years ahead of the Pentium 3 in the current Xbox.

What can Intel learn from its competitors? Firstly, to make multi-core design feasible, each core should be as simple as possible. As it stands, the Pentium 4 is too bloated to be a good candidate. In all the above cases, be it Niagara, Cell or Xenon, each core has been reduced to the most efficient form. This way, fewer transistors are needed per core and more cores can be fitted per chip. The Pentium M (Centrino) is a much better candidate in this case due to its shallower pipeline and simpler design.

Another area to reduce is cache. The main reason why CPUs are getting smashed by GPUs in floating point performance is the way new transistors have been mostly spent on cache whereas GPUs have constantly added new pipelines. With multi-threading, cache misses can be hidden by switching to other threads and extra transistors can be spent on extra cores. With multiple cores, cache can also be shared, leading to more efficient use. The reliance of cache should be greatly reduced once multi-threaded and multi-core designs are in place.

Moving to a multi-threaded model requires an equally ambitious improvement in bandwidth. Multiple threads are only of any use if they can be properly fed. Integrating the memory controller on the CPU will be essential. AMD has had great success doing just that with the Opteron. This is also a standard feature in many server chips. Sun's Niagara will have multiple DDR 2 controllers on die. Intel can't miss this if they are to expect their multi-core solutions to be competitive.

The take home message

The clock speed race as we know it is over. Going forth, single core CPUs are dead. No-one would dare say this until Intel admitted it themselves. Now that they have, we can rest the case once and for all. It was fun while it lasted, but it's time to move on.

In the coming years, multi-core CPUs are going to be the norm rather than the exception. Each core will be multi-threaded and multiple cores will reside on one chip. Clock speed will still increase, but at a much slower rate. Cache size will decrease as a proportional to chip size as transistors will be spent on additional cores.

On the software side, enormous emphasis will shift to multi-threaded programming. Intel will scream as loud as anyone to encourage developers to program with threads. Already this is under way to promote Hyper-threading. Better compilers will be produced to help in this effort. General benchmarks will most likely change focus to multi-threaded performance.

Toward the end of 2005, dual core desktop parts will be introduced by Intel and AMD. The launch chips will likely be slower than the fastest single core chips, but overall throughput will be greatly higher. Beefed up memory systems and chipsets will likely accompany the launch.

In 2006, all three next generation consoles will have either launched or be close to launch. Cell and Xenon are both massively parallel. The success of software content on these platforms should greatly encourage the move to multi-core CPUs and multi-threaded programming on the PC.

In the meantime, Intel has little compelling developments to offer. They will try to squeeze every bit out of the Pentium 4. Perhaps they will be wise and use the Pentium M for their multi-core chip, or perhaps they will be stubborn and bolt together Prescotts. In either case, Intel is now in line with the rest of the industry on multiprocessing. Let's hope they deliver something worthwhile.

Bibliography and Further Reading

Understanding Moore's Law
arstechnica.com/paedia/m/moore/moore-1.html
ftp://download.intel.com/research/silicon/moorespaper.pdf

Fred Pollack's original presentation
www.intel.com/research/mrl/Library/micro32keynote.pdf

On the various Pentium Processors:
www.informit.com/articles/article.asp?p=130978&seqNum=25
www.xbitlabs.com/news/cpu/display/20030327134746.html
en.wikipedia.org/wiki/Pentium

Niagara
arstechnica.com/news.ars/post/20041106-4377.html
www.theinquirer.net/?article=19423

Cell
www.cs.unc.edu/~zimmons/CELL.ppt
www.beyond3d.com/forum/viewtopic.php?t=18554

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LIGHTS, JOYSTICK, ACTION:

Masters of Machinima

The directors of tomorrow don't need fancy studios, expansive production teams, or even overpaid actors. It's all in the game, as Sholto Macpherson reveals.

Every year computer graphics take a step closer to the holy grail of high-end gaming, the cinematic experience. Surround sound, widescreen, cut scenes – the industry and the terminology made the crossover some time ago.

But the similarities with film go beyond basic consumption. Not content with watching games, many gamers and artists are using the latest gaming engines to put themselves in the director's chair.

Making a video using a game's engine is not a new concept – games designers have been doing it for years for their own story telling – but everyone else outside those with access to the tools and code weren't able to do the same.

This all changed dramatically with the introduction of 3D multiplayer gaming which brought two major advances. Titles like Quake were among the first to include tools that allowed gamers to record, and later playback, the devastation during gameplay.

The other breakthrough in some games was the ability to have a detached camera roaming around within a game which gave players an almost infinite number of camera angles – just like a film director would have.

Today, modding tools are standard for many games. New skins, levels and scenarios not only breathe new life into each title, they give more options to budget-minded directors looking for a fast and simple entry into 3D animation.

Games as art

Videos made using computer games are now referred to as *machinima* (pronounced 'Mash-in-EE-ma'), a combination of *machine* and *cinema*. The term is still new enough to cause mutterings among gamers who have been creating game-based videos for sometime, but the art world has taken to it with gusto.

In fact, the art of machinima is often confused with conventional 3D animation, as the two can produce identical results. Where animation renders an entire scene frame by frame, machinima uses a virtual world with virtual actors to deliver a similar effect often more efficiently and cheaply.

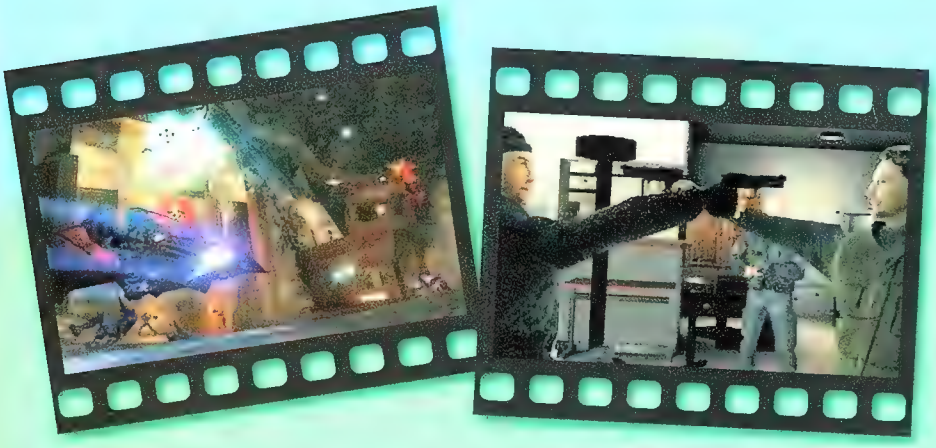
Players become actors, maps become the stage, and the game world a backdrop to it all.

Red vs Blue www.redvsblue.com by Rooster Teeth productions is the most well-known machinima series on the web today. Based on Halo for the Xbox, RvB is shot in Bloodgulch Gorge – a canyon setting favoured for multiplayer tournaments – and tells of the humorous antics the two misfit sides get up to.

Red vs Blue has enjoyed huge popularity – in fact the website receives some 750,000 downloads of the episodes each week – and is now about to air its third season.

Its appeal is not in the use of multiplayer Halo as a film set – an idea which, while done well, was not entirely original. It is the quality of the script that sets the sitcom apart.

Written by Bernie Burns (who provides the voice of Church) the series is at its best when ruminating on



LEFT: Microsoft's Halo forms the backdrop for the highly popular machinima 'Red vs Blue'. **RIGHT:** Scene from 'Only the Stronger Survive', which you'll find on this months cover CD.

the pointlessness of capture the flag multiplayer games.

The very first episode 'Why are we here?' begins with two red soldiers wondering aloud why they are fighting to control a canyon which has no way in or out and no strategic interest other than the Blue and Red bases at either end. 'Even if we were to pull out today, and [the Blue soldiers] were to come and take our base, they would have two bases in the middle of a box canyon. Whoopdi-fucking-do!' says one Red soldier, Simmons.

Helen Stuckey, games curator at the Australian Centre for the Moving Image in Melbourne, notes that 'Machinima is successful when it uses resources and ironies that the games throw up,' and that, for the most part, 'It's a really good way to discuss games intelligently.'

Machinima machinations

And, of course, a great way to discuss games frivolously too. At times the dialogue in Red vs Blue is banter lifted straight from the LAN room with such golden eloquences as 'you cock-biting fucktard!' If there's a philosophy on life behind Red vs Blue, sometimes it's well hidden.

Artists have latched onto the genre to create political art that flips the assumptions within a computer game on its head.

Eddo Stern is a San Francisco-based member of C Level www.c-level.cc, a group of artists and experimenters who use game technologies to create movies of their own interest.

Stern, who once served in the Israeli army, made the movie 'Sheik Attack' in 2000 that edited cinematic sequences from Settlers III, SimCity, Nuclear Strike and Red Alert into a politically charged commentary on the history of Israel. Images of the birth of the new state segue into military operations against Palestinian fighters in urban streets accompanied by a soundtrack of traditional Israeli songs.

The use of computer games to explore the desensitising nature of war or disaster carries its own irony. Television footage from cameras on smart bombs or taken through night-vision equipment is often criticised for reducing the reality of pain, death and suffering to, well, that of a video game.

Of course, not every piece of machinima is a vehicle for politics. Most videos are expressions of passion, from the gamers or film makers point of view. Fans of The Matrix, for example, at www.strangecompany.org used the Half Life engine to create short stories set in the world of The Matrix called 'Matrix 4x1', while the original Halo machinima jeep-flick 'Warthog Jump' www.warhog-jump.com by Randy Glass, that inspired many others, is a brilliant display of the Halo physics engine set to an entertaining soundtrack and clever direction. Watching six marines jump onto the bonnet of a Warthog moments before it is flipped up by an explosion, sending bodies hurtling through the sky like synchronised skydivers is inherently amusing and also an impressive display of the engine's ability to simulate gravity.

There are, to be sure, hundreds of videos made by gamers and clans showing off amazing feats of skill or flukes of grandeur available on the web, but most are merely videos of gameplay – even if edited and directed well – than any attempt at professional movie making. None-the-less, these are the base from which machinimators get a taste for the directors chair, and the fact that this can be done at all with just PCs and simple tools is an exciting opportunity

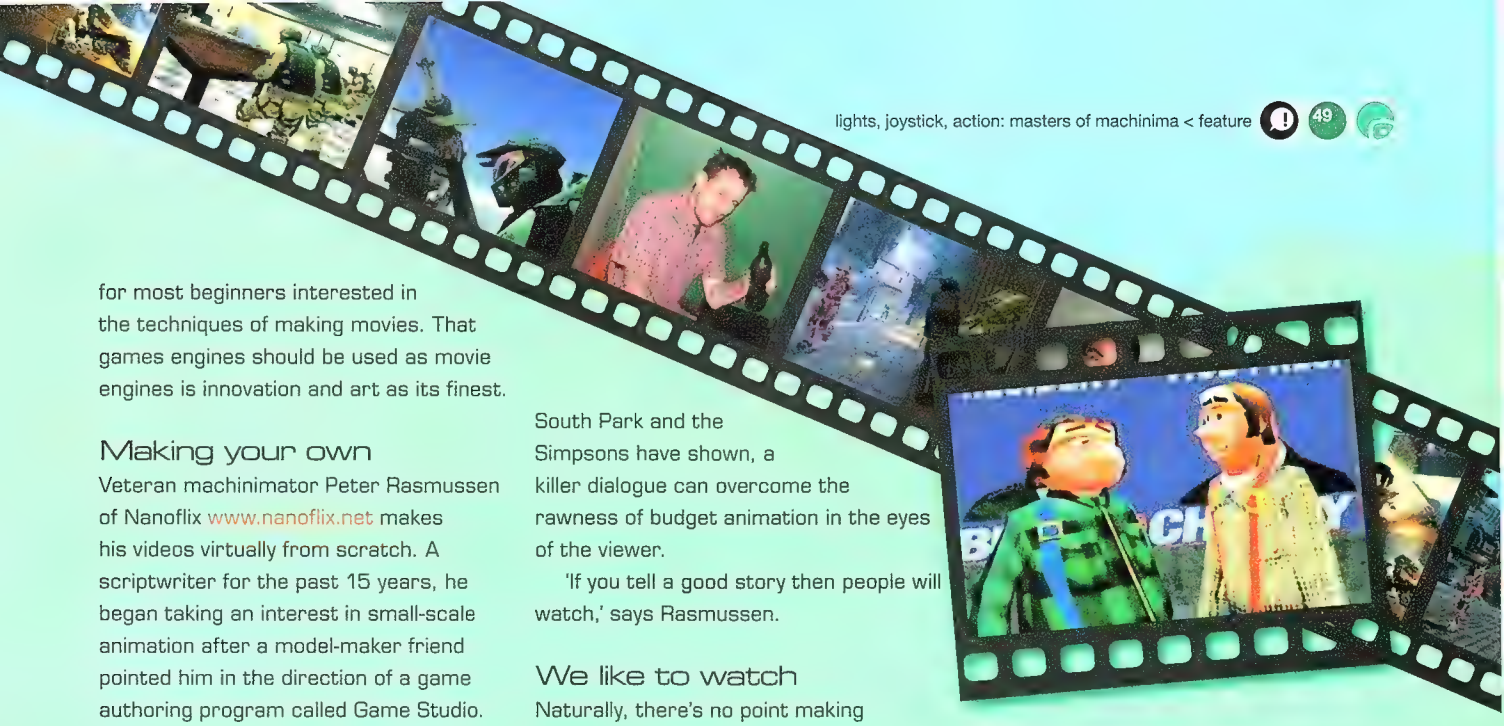
Australian Machinima

In Australia machinima has found a warm reception, receiving critical support from institutions such as the Australian Centre for the Moving Image. Rebecca Cannon of the Australian collective selectparks (www.selectparks.net – 'games by artists') first became interested in machinima after curating a show of game-inspired artworks in Melbourne.

Another source of inspiration was Melbourne artist Linda Erceg's commentary on the relationship between gamer and avatar, Punch Line, where characters from the Tomb Raider game dressed in naked skins masturbated using Lara Croft's signature pistols.

Cannon's own project, the Buff and the Brutal mildchoice.mine.nu/pub/buff, used the Quake 3 Arena engine and characters in a gay soap opera where 'fragging is synonymous with sex, linking in-game pleasure/pain responses to S&M sexuality'. The shoot itself took one 20-hour session to complete and involved eight PCs networked together, one for each character and camera angle. It took another two months to add audio and edit.

While Cannon used stock characters and map, some artists have designed their own mods to tie in with the storyline.



for most beginners interested in the techniques of making movies. That games engines should be used as movie engines is innovation and art as its finest.

Making your own

Veteran machinimator Peter Rasmussen of Nanoflix www.nanoflix.net makes his videos virtually from scratch. A scriptwriter for the past 15 years, he began taking an interest in small-scale animation after a model-maker friend pointed him in the direction of a game authoring program called Game Studio. Unlike machinima made using proprietary games engines such as Halo or Quake 3, videos created using the Game Studio engine are royalty free.

(Making machinima using a game engine owned by a software developer gives them a right to royalties if the work is sold and possibly right of approval if showing it on the web, particularly if the work is defamatory or obscene.)

While Microsoft Australia had no comment, Red vs Blue did receive a phone call from Redmond after its second episode suggesting they have a chat. If, as in the case of Red vs Blue, the content is positive, getting permission shouldn't be difficult or even necessary as software developers appreciate the promotional value.

One common stumbling block is the soundtrack. You can't sell machinima with someone else's music on it without express permission – and if the record company is involved it will want its pound of flesh too.

Warthog Jump is a case in point. A distributable version of the video is 'clean' to avoid wrangles with the estates of Jimi Hendrix and others.

Using a game engine to render the movie was not only efficient; Rasmussen could stop it at any time, unlock the camera and move it within the set, checking that objects and characters were on the right paths or connecting at the right time.

Few would be prepared to tinker with the mechanics to this degree and would prefer to work on the story itself. As South Park and the Simpsons have shown, a killer dialogue can overcome the rawness of budget animation in the eyes of the viewer.

'If you tell a good story then people will watch,' says Rasmussen.

We like to watch

Naturally, there's no point making machinima unless it's available for everyone to see. So once a budding movie director has made their masterpiece, how do they get it shown to the widest audience?

Machinima.com www.machinima.com regularly posts new films and has an archive divided into familiar categories -- comedy, horror and action -- like a regular video store.

The US-based Academy of Machinima Arts and Sciences www.machinima.org holds an annual competition open to machinimators around the world. The academy has postponed its November closing date by several months so if you're interested in entering, you can apply.

Australia's own ACMI www.acmi.net.au is also willing to screen good-quality machinima on its plasma screens for visitors to Federation Square in Melbourne.

Going mainstream

Whether political commentary, comedy or bragging flick, machinima is going to get a lot bigger. At least one major title release has been delayed until the accompanying editing software was ready and The Sims 2 is the first Electronic Arts game to deliberately make video-making tools a standard component for all players.

Gus, Geoff and Burnie from Rooster Teeth are already setting the standard with a series based on the Sims engine and characters called The Strangerhood www.strangerhood.com commissioned by EA.

Machinima's greatest achievement is to create a genre that gives gamers the chance to do much more than just play a game to completion. As three guys from Texas who played too much Halo have shown, playing computer games can even make you a lot of money.

LEFT: Gus from Rooster Teeth on visit to Melbourne recently. Their series Red vs Blue has become so popular that gaming giant Electronic Arts sought them out to create a new machinima based on The Sims 2 – The Strangerhood strangerhood.com.
RIGHT: Veteran machinimator Peter Rasmussen of Nanoflix.

DIY Machinima

Shooting films in a virtual environment sounds like a wallet-crushingly expensive exercise requiring Cray boxes. Which it can be, if you're the kind of guy who likes to bang out full-frame animation in a feature-film format.

For the rest of us machinima is a much simpler alternative that requires just a PC and a decent video card.

On the software side you will need a video-capture program and a video editing suite.

Software options depend on whether you record directly to the PC's hard drive or go first through a video camera and feed it into a video editing package.

Techsmith's SnagIT for PC (US$39.95) or Ambrosia's Snapz Pro X2 for Mac (US$69) capture direct to hard drive, but this requires a much faster processor to get a good frame rate – at least 3GHz, says Selectparks' Rebecca Cannon.

When it comes to video editing Adobe Premiere or Final Cut Pro are respective favourites for each platform, but these are both extremely expensive retailing for around $1500.

Apple offers a cut down version, Final Cut Express for $500 but the best budget options are iMovie or Windows Movie Maker.

The kind folk at Strange Company run the very useful www.machinima.com which has tips and hints for making machinima as well as a good selection of archived films. Machinima.com also has a Machinima Production Kit www.strangecompany.org/page.php?id=50 which is a complete, one-stop package of open-source applications for beginner machinimators.

There are several open-source tools available for those who take the PC path. Unreal Movie Studio unframed.brokenpipefilms.com/ums and Real Time Movie Studio www.planetunreal.com/reactor4 are both based on the Unreal Tournament engine; Keygrip 2 (www.planetquake.com/keygrip) uses Quake.

Next to 3D animation machinima is comparatively modest in its hardware requirements. The more you require the game engine to do, the longer it will take and the more grunt is required.

Nanoflix Production's Peter Rasmussen managed with just 128MB RAM on his 2GHz Dell, although he would prefer 500MB. Cannon's 400MHz Powerbook G4 was packed with 768MB RAM, which she said was adequate 'but twice the speed would have been much nicer.'

For the record, Red vs Blue uses four Xboxes, four copies of Halo and a PC with a Canopus DV Storm capture card and Adobe editing software, according to the website.

The easiest way to make machinima is to record video straight to hard drive on the same PC used as the source. However, as mentioned earlier this is processor intensive and cuts down your directorial options.

Videos with multiple actors will require a separate PC or console for each player or 'puppeteer' networked into the PC recording the final image.
Each extra camera view will also require a PC/console; machinima is not well-suited to ambitious cinematographers or large casts.

Capturing to VCR or digital video camera makes it easier to do several takes without running out of hard drive space too quickly.

It's always best to keep the signal digital for the highest quality. If you can get a digital video camera over a VCR then that's two unnecessary conversions avoided – from digital to analogue and back again.

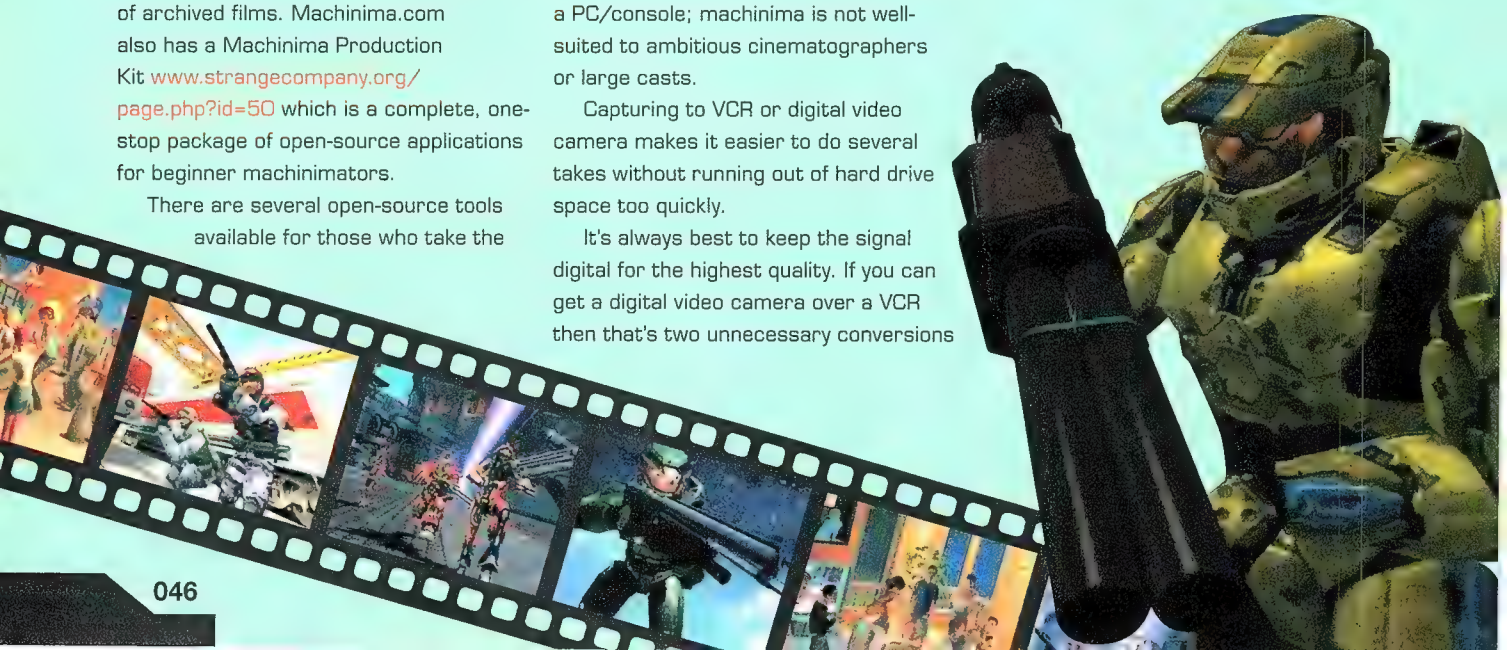
The beauty of digital video editing is that you can patch together one perfect sequence from a number of botched efforts. Which means it is possible to 'enhance' your game play in that last multiplayer match and rewrite history a little. Not that you'd need to, of course.

There are several types of formats for compressing video, and choosing the right one depends on what you want to do with the file. It is always worth keeping the original, uncompressed footage (at full-screen resolution) so a high-quality version is always available. If you're recording from a digital video camera, it will be in DVPAL. VCD takes MPEG-1, DVD requires MPEG-2, and MPEG-4 is the best format for the web, according to Cannon.

The amount of storage needed is mainly determined by the length of the video. However there are a number of other variables that make it impossible to accurately predict file size.

For example the amount of movement in your piece will affect MPEG compression rates. Lots of action will end up creating a much larger file size than a monologue straight to camera.

Using the five-minute Buff and the Brutal as a rough guide, the original DVPAL was edited down to 1GB and shrank to 54MB in MPEG-1 format. Cannon also has some tiny MPEG-4 versions on her website; 1.2MB for suckers on dial-up and 9.4MB for people in a hurry.



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Write	48x	
Rewrite	24x	
Read	48x	
Data Buffer Memory	2MB	
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Reviews

Tough or too rough

Nathan Davis considers the value of shortcuts in the search for innovation.

Perhaps it's a reflective of part of our driving nature, but it's interesting to see manufacturers willing to try almost anything to beat the competition. And while at times this is great for innovation, it sometimes leads to shortcuts in production. We often see products that are rough around the edges, and it's the end users that get the raw end of the bone.

Now don't get me wrong – this is the exception and not the rule, but in the highly competitive marketplace it can become all too common.

Let's pick on an oldish example – the 16ms LCD monitor. In a bid to oust the competition and be the first with a particular type of display running at such low milliseconds, our dedicated Labs monkeys discovered a number of nasty shortcuts.

These involved only having a select colour range updating at the promised speed and the rest at much slower, and the result was a reduction in quality. This is a classic example of the consumer being publicly probed with a de-lubified 10-foot barge pole. So naturally it's fair to be sceptic – as a result of experiences with these products – about whether future developments, such as the range of ever faster response time monitors that will arrive, will be the real deal or a shortcut thereof.

Driver cheating is another weird area. Both NVIDIA and ATI have been caught with their pants down in the past tailoring drivers to perform better in certain commonly used benchmarks.

The e-drama that followed caused a great debate – afterall, if the drivers were optimised for a certain game often used as a benchmark, did it matter that the drivers were tailored for it if it gave the gamer a faster FPS?

In some cases it did – as image quality could be sacrificed for FPS, and the end user who spent their hard earned dough on the card wouldn't have any choice in the matter.

But more than anything else is simply the fact that both companies tried to pull the wool over the eyes of the media and end-users alike, which is just not cricket if you're trying to inspire brand loyalty.

And some of this may soon change.

In an odd twist, the philosophy of open source is moving from software to hardware – The Open Graphics Project is a call for a GPU that is completely open in its documentation and drivers so that developers can make full use of a GPUs capabilities without relying on the manufacturer.

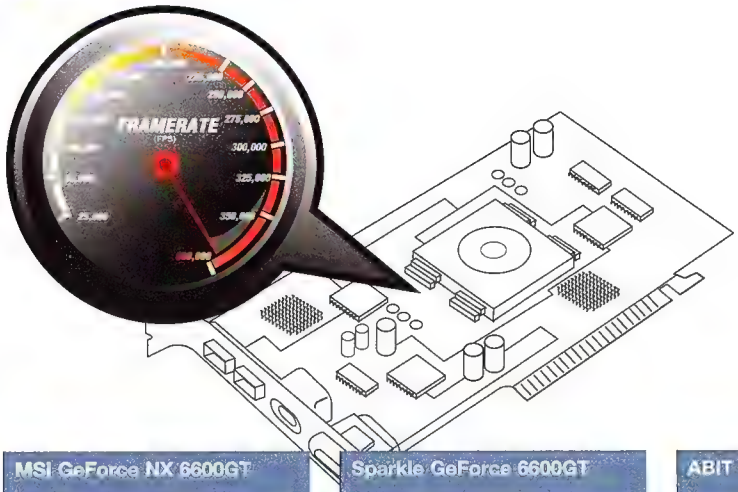
Aside from giving developers the ability to make fully supportive drivers for open source software, it also means that users won't be left with an out-of-date product should the manufacturer go under and cease to exist – if the specs are open anyone, not just the manufacturer, can update the drivers or add new support. It's an interesting idea and we'll certainly keep and eye on it. Read more about it here: lists.duskglow.com/mailman/listinfo/open-graphics.

So when it comes to quality where is the line drawn? Even as hardcore enthusiast technology consumers, we don't exactly have access to manufacturing blueprints or processes, and have little influence aside from emailing product managers about what we'd like to see.

For us, it's unacceptable to make shortcuts on the products we spend our hard earn cash on, but for manufacturers it's sometimes a fine line between pushing for innovation to differentiate a product, or making shortcuts to ensure a product stays ahead of the pack.

The first cutting-edge 16ms LCDs that had problems could be seen as innovative or taking shortcuts, depending on which side of the fence you sit!

Ultimately, though, products speak for themselves – if it's good and the customer feels like they got value, they'll be back again in the future.



Framerate

Get some framerate into you.
Now in double vision (when drunk).

MSI GeForce NX 6600GT

Specifications: AGP; NVIDIA GeForce 6600GT; 128MB 128-bit GDDR3 RAM; VIVO.
Core speed: 500MHz
Memory speed: 900MHz
Price: $TBA
Supplier: MSI
www.synnex.com.au

MSI have really put together a great bundle with this top 6600GT. Packing VIVO with composite and s-video out and component and s-video in, a wad load of software and games including XIII, Prince of Persia: Sands of Time and Uru, this doesn't go light on anything. Except for the emitted sound, which is damn quiet considering the other boom boxes out there. If you're after a decent card with the whole shebang, this will blast some bells and whistles into you until the purple cows fly home.

MSI
www.msicomputer.com.au

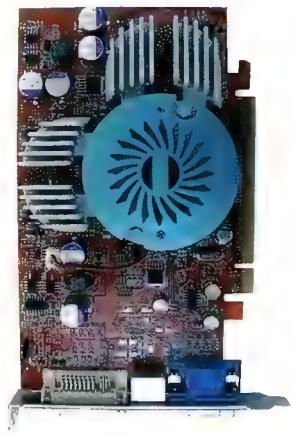
Sparkle GeForce 6600GT

Specifications: AGP; NVIDIA GeForce 6600GT; 128MB 128-bit GDDR3 RAM.
Core speed: 510MHz
Memory speed: 1000MHz
Price: $341
Supplier: Australia IT
www.australiait.com.au

The 6600GT has stormed in on the PCI Express platform and finally it's here to enlighten AGP on how it's done. With the performance of a workhorse at hardly a matching rich price, Sparkle have put together a 'barebones' package, with zip in the way of mediocre software and just delivering a damn decent card. As a neat side benefit of the chip, it's also equipped with component. This baby would make a great choice for the mid-range gamer simply after a damn good mid-range card, bar the extras.

Sparkle
www.sparkle.com.tw

ABIT RADEON X600 PRO

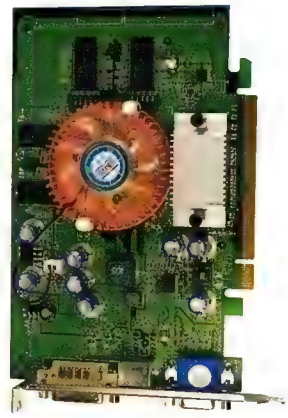


Specifications: PCI Express; ATI RADEON X600 PRO; 128MB 128-bit GDDR3 RAM.
Core speed: 400MHz
Memory speed: 500MHz
Price: $209
Supplier: Altech
www.altech.com.au

Even further down the tree from the X700 in terms of performance, this lower end card is workable for a low end budget gaming system – or even a rebound card if you've just lunged over to PCI Express. Well priced, it's definitely a competent card that would fit perfectly in a Home Theatre PC that requires a capable 3D foundation for the occasional lounge room gaming-fest. Equipped with 4ns TSOP memory, it's already running at peak so forget any sizeable overclock. Cheap, quiet and next gen.

ABIT
www.abit.com.tw

Jaton Video-PCX GeForce 5750

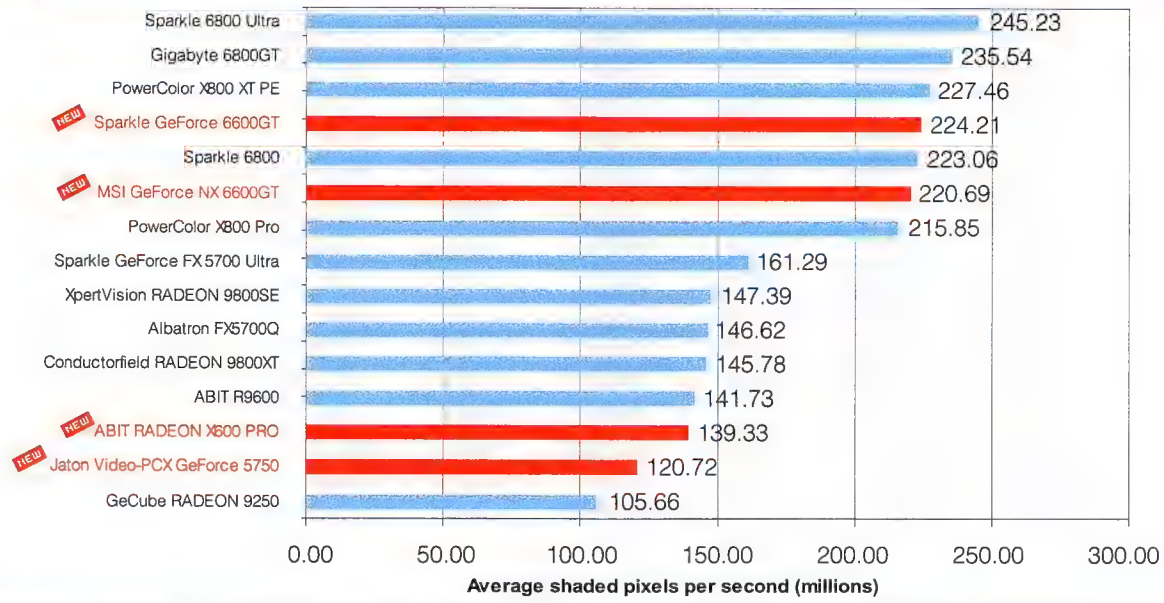


Specifications: PCI Express; NVIDIA GeForce 5750; 128MB 128-bit GDDR3 RAM.
Core speed: 425MHz
Memory speed: 500MHz
Price: $250
Supplier: Jaton
www.jaton.com.au

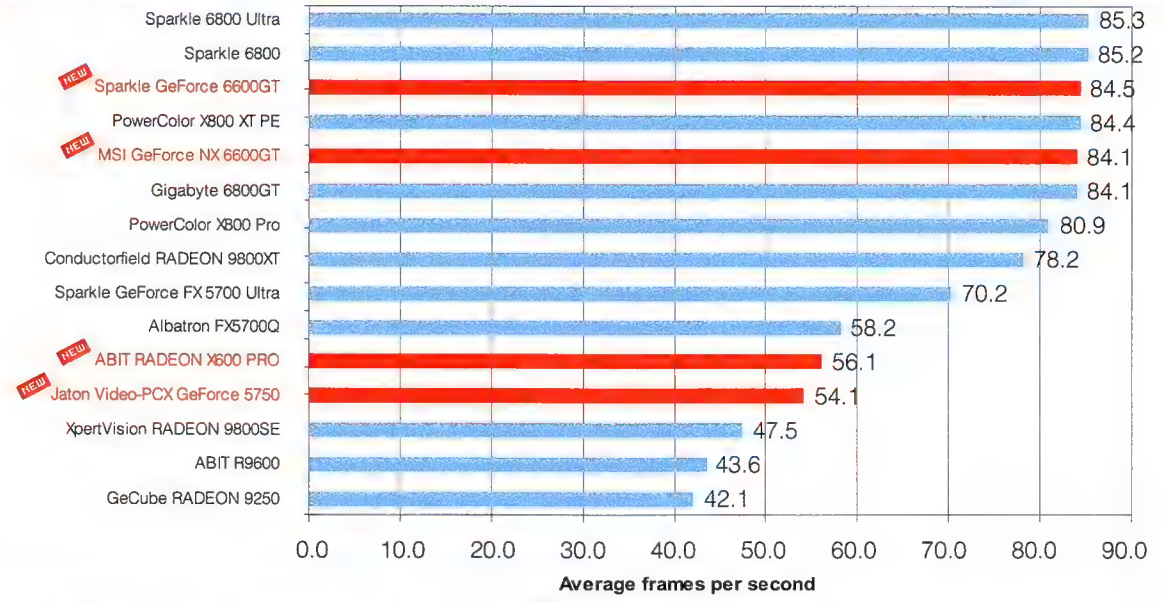
With frequencies slightly faster than the X600, it doesn't quite manage to match up performance wise. Featuring a thin copper heatsink, it's actually slightly quieter though. As with the previous ABIT X600, it slots in perfectly toward the low end gamer market wanting to move over to PCI Express but who hardly have the moolah factor to do so. It even comes sealed with a copy of America's Army and Soldier of Fortune 2. If that's your dilly-ho, point your nose this way.

Jaton
www.jaton.com.au

Aquamark 3



Call of Duty - 1280 x 1024



Video cards

After ATI's announcement of the X850 and new X800 series RADEON cards the graphics market has quietened down for now, although expect to still see activity as both NVIDIA and ATI scramble to supply rare high-end cards to retail.

Perhaps the most significant product launch of recent times happened at the low end of the scale in the form of NVIDIA's 6200TC cards. TC stands for Turbo Cache and refers to the ability of these chips to use system memory in a much more versatile way than before. Similar in concept to virtual memory in windows, the 6200TC cards have a small amount of onboard RAM, say 16MB. This card is then able to access a total of 128MB RAM thanks to the bidirectional communication inherent in PCI-Express. This won't be as fast as using 128MB of memory onboard, but it will significantly reduce cost. Expect this technology to eventually appear on high-end cards as well.

CPUs

As AMD quietly continues to introduce it's 90nm Winchester Athlon 64 core to market, there is little else going on. Both AMD and Intel are ramping up towards a shift to Dual Core architectures some time in 2005, which means that there wont be many changes or enhancements to the current lineup for some time yet.

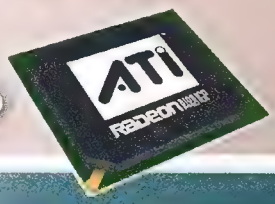
The big news in the CPU space is the growing availability of PCI-Express chipsets for AMD's platform. NVIDIA has three versions of its nForce4 chipset ready to go in the form of the nFOrce4, nForce4 Ultra and nForce4 SLI while VIA should finally lift the lid on its delayed KT890 chipset sometime real soon. ATI's new Athlon 64 chipsets should also be appearing, although expect Micro-ATX initially.

As dual core is still a while away the next big thing to happen will come when NVIDIA lifts the lid on it's recently announced Pentium 4 chipset, rumoured to be called nForce5.

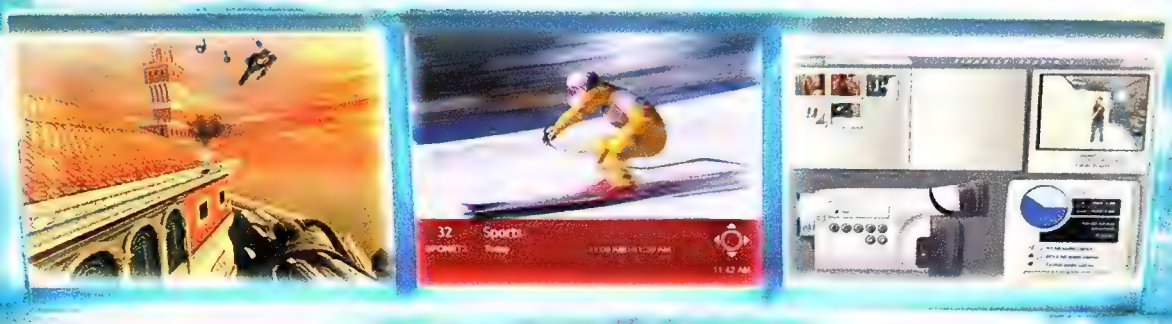
ATI
RADEON
DESIGNED ON RADEON
BEST ON RADEON
HALF-LIFE 2
戰慄時空 2
ATI
RADEON
ati.com

ATi RADEON IGP

SUPERCHARGED GRAPHICS
RIGHT ON YOUR MOTHERBOARD



SURROUNDVIEW



ati.com

Alienware Aurora FX-55

John Gillooly peeks inside the Australian debut from gaming's best known system builder.

Supplier:
Alienware
www.alienware systems.com.au

Website:
Alienware
www.alienware systems.com.au

Phone:
Alienware
(08) 8352 1199

Price:
$4765

Specifications:
Athlon 64 FX-55; ABIT AV8 motherboard; RADEON X800XT PE; 240GB RAID 0 array; Audigy 2 ZS; Dual Layer DVD burner; 1GB RAM.

From humble beginnings as a builder of performance gaming PCs Alienware is now a serious player in the system builder stakes. In the past we have only heard about Alienware systems from the US, but now the company is opening up in Australia we finally have a chance to see what the fuss is all about.

While the custom case design is uniquely sexy the two most obvious advantages that a system builder like Alienware has over DIY solutions are convenience and buying power. We all understand the convenience of buying a pre-tweaked system ready to go out of the box, and Alienware have pretty damn stringent quality checks on systems, while also ensuring they are tweaked and ready to go out of the box – you can even specify what games you want it tweaked for! (We received the Half-Life 2 tailored 'City 17' configuration) Buying power on the other hand is not as well understood. Companies like Alienware have the leverage to source initial supply of high end components. For example, while boxed AGP RADEON X800 XT PE cards seem a figment of the retail channel's imagination, Alienware are one of the few companies with a steady supply.

In fact, there is one of these cards in the Athlon 64 FX-55 based Aurora system supplied by Alienware for review. It also has an ABIT AV8 mobo, 1GB of Corsair low latency DDR RAM, 240GB of storage thanks to a RAID 0 array of two 120GB Western Digital hard drives, an Audigy 2 ZS and a Dual Layer DVD burner. Keyboard, mouse, and Windows XP Pro are also supplied.

It is a pretty damn impressive collection of hardware, all packed into the sexy green Alienware case. And it would want to be. While Alienware has systems for under $2000, this particula beast costs $4765. With such a premium price, we were looking forward to the sort of performance that can be delivered by the Aurora FX-55 system.

We tested the system using Doom 3, Far Cry and 3DMark05. In each of these tests the Aurora FX-55 performed in the top-end of what we'd expect from this hardware. It managed 50.3 frames per second in Doom 3 at 1600 x 1200 High Quality. Far Cry saw the system averaging 89.4 fps in the Bunker Demo and 84.1fps in the Treehouse demo (these tests were at 1600 x 1200 with all settings except AA and anisotropic filtering set to the maximum). It also delivered 4928 in 3Dmark05, which is damn good in the current performance landscape.

To our surprise the system is AGP based, using a VIA KT800P chipset, even though Athlon 64 PCI Express chipsets are available at the time of writing. While there is no performance difference between AGP and PCI-E per se, for the price some form of future proofing would have been nice. This will likely change soon with future Alienware releases, and it's worth looking out for if you want to keep an upgrade path available.

Overall the Aurora FX-55 system is an incredibly well built and tweaked system (with some of the best cable tying work we have ever seen), and while the performance is impressive, it's still undeniably expesnive, and this holds it back from a higher score.

The Aurora is clearly targeted for those endowed with more cash than time, and it will be interesting to see how it fares in an already crowded retail market. In fact, where we envision Alienware really making its mark is in the notebook space, where it offers a series of bleeding edge products with technology that no-one else has at the moment.

For the first Alienware machine in the country, it's a good start. Welcome to Australia Alienware.

SCORE **8/10**

Shuttle SB86i

John Gillooly watches Shuttle dance to the BTX.

Supplier:
Altech
www.altech.com.au

Website:
Shuttle
www.shuttle.com

Phone:
Altech
(02) 9735 5655

Price:
TBA

Specifications:

i915G chipset; pico-BTX form factor; supports LGA775 CPUs; two 3.25in SATA drive bays, four USB 2.0, 8-in1 card reader; Intel HD audio; x16 PCI-E graphics.

At first thought one wonders why Shuttle has bothered to create an XPC model based upon Intel's new BTX standard. After all, it created the small form factor market, and it has already delivered countless small form factor models that have been both cool and quiet. BTX has several shortcomings that the XPC has traditionally avoided, largely based around the unfeasibly heavy thermal module.

While this module won't damage the CPU as it bolts solidly into the chassis not the motherboard, it does make a BTX system weigh as much as some full sized boxes. Shuttle has designed the SB86i precisely to the pico-BTX spec, and this includes the use of Intel's thermal module rather than Shuttle's custom ICE cooling solution.

The combination of thermal module and a steel frame makes the SB86i quite heavy, but weight aside this box really is a work of art. It uses some of the technology previously seen on models of XPC, introduces some new things and does so while conforming to the stringent BTX spec. It's heft and larger than usual size mean that it isn't a great choice for mobile gamers, but it is a great option for systems that don't move around much.

The motherboard uses Intel's i915G chipset to good effect. Besides the integrated graphics built into the i915G it has one x16 PCI-Express graphics slot and a single PCI one. On the top of the chassis sit two 3.25in drive bays, designed to use SATA drives. It also fits a single optical drive.

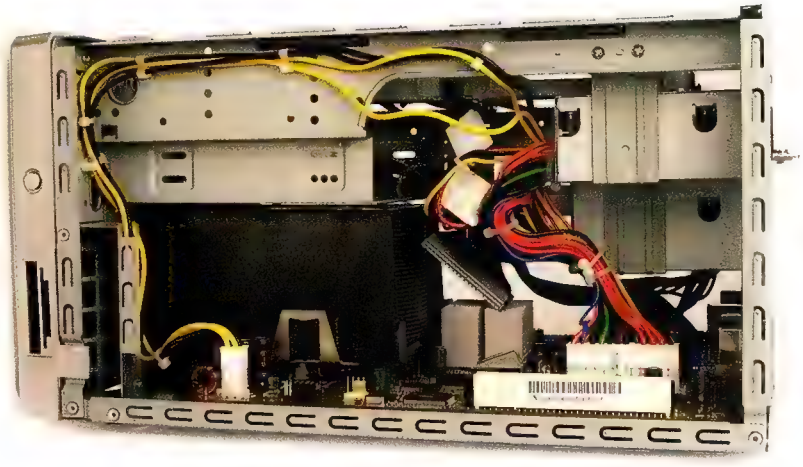
It is a quite spacious interior, with cables tied away and clear airflow provided between the two fans needed in a BTX system (air comes in through the thermal module at the front and exhausted through the fan on the powerful 275watt PSU at the back). It also uses a series of different tricks to improve cooling and help it stay virtually silent while not being crippled by Intel's 90nm Prescott heat pumps. Like previous XPC models the system runs coolest when the case is on, not off, despite what hardware geek logic tells us.

On the left of the front panel, facing sideways, are two USB, one FireWire and two audio jacks. On the right hand side are the power button and slots for the integrated 8-in-1 card reader. This adds up to a very neat solution and allows for a clean front panel with only the outline of the stealthed drive bay and eject button on the front itself.

On the rear are the standard assortments of expansion points as well as the wonderful Shuttle addition of a CMOS clear button to save diving for jumpers inside the case. It's these little touches that add up to make the SB86i a really nifty piece of hardware.

Our major worry with the product is the fact that it is so incredibly heavy for a small form factor box, which negates the portability advantages of the XPC.

The SB86i would make a great media box, or non-mobile desktop PC, but the deficiencies of Intel's BTX form factor only serve to highlight the advantages of Shuttle's custom XPC designs. It is almost time to start looking at small form factor systems in terms of lightweight systems and desktop replacements.



SCORE **8/10**

Albatron Trinity GeForce 6600GT

Supplier:
AMI Computers
www.ami-computers.com.au

Website:
Albatron
www.albatron.com.tw

Phone:
AMI Computers
(02) 9763 2122

Price:
$349

Specifications:

NVIDIA GeForce 6600GT GPU; AGP 8x; 500MHz core; 128MB 1000MHz effective 128-bit GDDR3 memory; eight pixel pipelines; three vertex shaders; Shader Model 3.0 support; TV-out.

If we haven't already confirmed enough that the 6600GTs rock, we don't know where we missed the mark. It rocks, solidly, and is without a doubt *the* most impressive little mid-range beast we've come across in our time. The only problem being it was only available on the PCI Express platform. The same platform that people are still relatively reluctant to hurdle themselves onto, even with all the vendors seemingly noosing the heard that way. Considering its greatness, it would have been unjust not to release an AGP adaptation, so here she is.

As you may have read by now, John G's H to H demonstrated that the power of SLI lives at the peak of Mount Tantalise. Alas, SLI in AGP is a sheer 'forget about it' pipedream, but regardless, if it performs on par with its PCI-E counter part, this compiles into a bowl of moot rice.

Without much ranting about, we decided to pop this hot monkey into our standard Athlon 64 test bench. In 3DMark2003 it managed to pump out a juicy 7510 3DMarks and in Doom 3, high quality at 1280 x 1024 it really proved its worth by framing a consistent 55.7fps. This proves the AGP bus is hardly a bottleneck for the 6600GT, though some areas in the time demo, when loading, were more prone to loading a bit longer. Overall, a tiny bit slower than the PCI-E incarnation, but by no means noticeably worse.

The design of this card produced perhaps a little too much excess on the acoustics side of things – let's just say it sounds about as loud as it looks. There isn't much to vouch for in terms of the included software package (Arx Fatalis, anyone?) but who really gives a damn. The idea is for a cheap yet decent performer, and that's what we have here.

A natty aspect regarding the TV out on the 6000 series of cards is component, and here it is on AGP.

Albatron have found a winner in the AGP 6600GT with this card, those Kleenexes came in mighty handy. Again. This card is also one of the *best cooled*; just mind your internal decibel detectors. ND

SCORE 9/10

Aerocool Lubic-Combo

Supplier:
XCOM Technology
www.xcom.com.au

Website:
Aerocool
www.aerocool.com.tw

Phone:
XCOM Technology
(02) 8338 9667

Price:
$135

Specifications:

PC case building kit; includes instructions for two designs; aluminium frames; stainless steel joints; all required screws included; wheels; propeller; power, reset and activity lights panel; available in silver, blue and black.

Tail fins, wheels, framework and a propeller. Not the standard parts you might expect from anything other than a model airplane – let alone a computer case. It's more like a *potential* case, as it comes boxed as a bundle of aluminium bars and assorted other bits, ready for some custom-case assembly. This had us running rampant around the Labs, screaming excitedly and baring our hairy chests. Cases don't always have this effect on us.

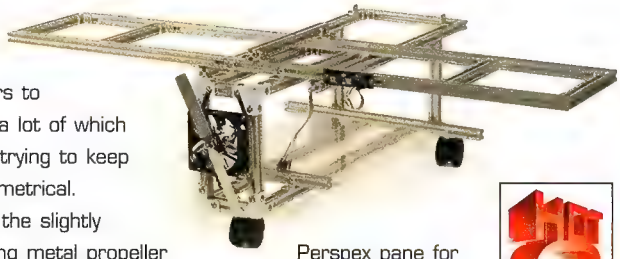
The 'Fighter Plane' design we chose to go ahead with is an interesting example of the potential this kit has – and was more exciting than the other instructional 'Conventional PC case' design. The idea is for you to use your juicy imagination and come up with your own design.

You'll need some time on your hands, as this design took us close to five hours to assemble, a lot of which was spent trying to keep things symmetrical. Included is the slightly disconcerting metal propeller you might not want to attach to a fan unless you really hate people.

The main negative aspect we had against this otherwise awesome case kit were the manuals. They're on a CD in MS Word format and this keeps the cost down, but one of the files has bloated to almost 100MB. Printed would have been nice.

Disregarding the thin Engrish flavour, the instructions and accompanying photos are generally readable but could have done with a spruce up in areas. But really, these are just to get a basic idea on what all the parts are for so you can get your own case design happening.

This kit also comes with a Perspex pane for the mobo, and is easily slotted into the channels on the framework, so getting custom windows happening would be a piece of cake.



Aside from the small niggles, we couldn't be happier and this is definitely the holy grail Meccano kit of computer cases. If you want to build a custom box but hardly want it to look like an imploded cardboard box, the Lubic series comes highly recommended. ND

SCORE 9/10

BenQ FP71E+

Supplier:
BenQ
www.benq.com.au

Website:
BenQ
www.benq.com.au

Phone:
BenQ
(02) 9714 6800

Price:
$699

Specifications:

17in LCD; 1280 x 1024; 8ms response time; 0.264 dot pitch; 300cd/m2 brightness; 500:1 contrast ratio; D-Sub and DVI; speakers.

LCD panels are plummeting in response time at a crazy rate. And we love crazy rates; as long as they don't involve pain. Or tax. Hitting in at 8ms, this certainly promises one sexy experience – ready to quake your jocks. Or even just make for some heavenly gaming.

Simple in design, this 17 inch display is relatively more attractive than the previous plastic blue wonder from BenQ – and it even has the same tinny speakers. Just forget they're there.

Heading straight into gaming, to our eyes, there's hardly any noticeable difference between 12ms and 8ms – it's just too fast capt'n! Nonetheless, gaming on this thing of beauty is insanely gorgeous, with the crisp advantage of LCD and a decent contrast ratio bar, it's just a joy to use

Testing with DisplayMate revealed a few concerns – an odd dithering that seemed to be occurring in the colours. Even when using DVI, some mixes of colours – and shades of black – have a dithering pattern, which brings us to wonder whether the superfast response time is affecting the displayi of a full 16 million colours. That said, there were no discernible artifacts in real world testing (playing games, for the laymen)

There are several 'modes' that the display can be set in – standard, Movie1, Movie2 and Photo. Standard is the better setting for general use, as the others had halos around dark-on-light objects. They are certainly useful for movies and photos though, as they add more saturation and also sharpen the image.

There is a light shadowing around the edges where the backlight is slightly missing the panel. It is so faint, we hadn't noticed this until we went into synthetic testing, so this really shouldn't be of much concern unless you plan on playing pong in *one* colour.

On the plus side, the phase control couldn't get any better.

Overall, the BenQ FP71E+ is a well equipped and feisty LCD monitor – ideal even for fast paced fragging – and represents a new wave of super-fast LCD monitors entering the market. And more 8ms LCD monitors can only be a good thing. ND

SCORE **8/10**

Thermaltake Hardcano 13

Supplier:
PC Case Gear
www.pccasegear.com.au

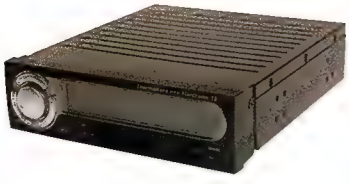
Website:
Thermaltake
www.thermaltake
.com.au

Phone:
PC Case Gear
(03) 9584 7266

Price:
$116

Specifications:

4 x fan/temperature digital controller bay; six-in-one media reader supports CF, IBM, Microdrive, SM, SD, MMC and MS; displays time, fan speeds and temperatures; auto and manual fan control; eight backlight colours.



It seems only a week or two goes by and there's another Rheobus hitting the shelves. Well this digital baby was actually well thought through and considering our past experience with Plastinium, it by far shat all over our expectations in terms of its usability.

Equipped with a six-in-one card reader, ensure your mobo has a an onboard USB header or you're pretty much screwed for the large part. Unless you feel up to whipping up a USB cable, this is the only way the reader will function. And fair enough, but just because you have a new mobo doesn't mean it has such a header. We were slightly taken aback that some of the next-generation test benches we have running didn't have one (USB headers being the least of our concerns).

Once fired up, we really couldn't be happier. With your appearance tastes catered for in the form of eight selectable backlight colours and the ability to monitor and change fan speeds and their relevant temperatures and alarm settings – it's just a damn good package. The temperature alarm settings are a tad limited – 40°C, 50°C, 60°C or 70°C – the former of which may be a tad worrying for some in regards to ambient temperatures.

The only major drawback on this swanky unit was switching between manual and auto fan modes. Say you start on manual and you have all your fan speed settings perfected – now you hit auto. It'll do it's thing and have the fans go as slow as its sees fit with regards to the paired fan probe – and that works like a treat, by the way.

But switching back to manual, all your settings are lost. It's just a small gripe on our part, but it really would have been a nice addition had it remembered these settings – as there is an onboard battery to remember the time.

Overall though, the new TT Hardcano 13 by far outperforms the previous editions both in terms of usage and features. And considering there are other more pricey units out there, it could hardly be more feature packed if it tried. This latest offering is certainly a worthy successor to an already popular bay controller. ND

SCORE **9/10**

ABIT Fatal1ty AA8XE

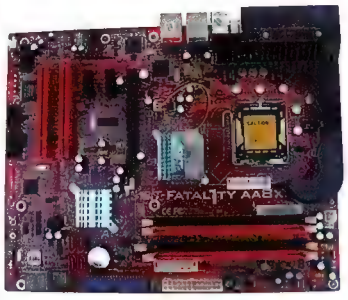
Supplier:
Altech
www.altech.com.au

Website:
Abit
www.abit.com.au

Phone:
Altech
(02) 9735 5655

Price:
$420

Specifications:
Intel 925XE chipset; 1066MHz FSB; four SATA; one PATA; four dual channel DDR2 DIMM slots; one 16x PCI-E and two 1x PCI-E slots; three PCI slots; 7.1 AudioMAX Dolby; one 1000Mb/s and one 10/100Mb/s Ethernet ports.



Named after the famous gamer, 'Fatal1ty', this ATX form factor mobo features the latest chipset from Intel, the 925XE. The special loving this chip has received, in comparison to the 925X, is support for the new LGA P4EE's 1066MHz FSB.

Seeing as the nForce4 mobos weren't shipped with SoundStorm, it's great to see someone else in the market standing against the mediocre AC'97 codecs. It includes a generous offering, with 7.1 surround sound using Dolby's first licensed copy of Dolby Digital Live. In terms of comparative listening quality, it matches the Audigy 2. Wow indeed.

It was certainly designed for the gamer/tweaker. Firstly, the PS2 ports remain. If you are a hardcore gamer, you would know how important these are, as the CPU reserves a separate IRQ for each port, giving way to maximum frag precision. Next, the inclusion of two Ethernet ports. One is Gigabit, and although it's hardly advantageous for current LAN gaming, it further future proofs the mobo. With two, network performance isn't dropped when gaming on one and file sharing *Linux ISOs* on the other.

Finally, as has become one of ABIT's strong points, they've stuck to their trademark of fitting on handy doohickies such as reset and power buttons, POST readout, onboard activity lights and a well laid out BIOS menu system, amassed with tweaking options. We were, however, taken back by its single PATA port.

In terms of performance, it's no lamer. With a 3.46GHz P4EE and 6600GT, the scores hit in beautifully at 57.1fps for Doom 3 in Demo 1 at 1280 x 1024, high detail and 5385marks in PCMark04.

Obviously aimed at the high end gamer, considering LGA 775 P4EE CPUs are the only processors with such a premium FSB, we were slightly perplexed with the single 16x PCI-E slot – alas no SLI, as that's still an nForce piece of wizardry.

All considered, it's a damn good chipset which ABIT have managed to outfit perfectly with all the right features for the serious gamer (excusing the single PATA port). If you're looking at grabbing yourself a 1066MHz FSB CPU and a 925XE mobo, this red beast would make a sw33t cho1ce. ND

hotaward

SCORE 9/10

Altec Lansing GT5051R

Supplier:
Audion
www.audion-mm.com

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www.audion-mm.com

Phone:
Audion
1300 300 364

Price:
TBA

Specifications:
80W RMS total continuous power; two 3in 10W front speakers; two 3in 10W 'surround' speakers; 3in 10W centre speaker; 5.25in 30W subwoofer.

The Altec Lansing GT5051R speaker set is designed to do one thing – excluding the obligatory translation of digital sound into the audible variety – and that is to emulate a 5.1-channel setup using, seemingly, just three speakers and a subwoofer. On closer inspection, the two side speakers actually consist of one bottom speaker that faces towards the user, and a top speaker orientated to the left for the left speaker, and right for the right.

As confusing as this sounds, it's not such a bad idea. Theoretically, the audio should bounce of the walls of the room and back to the ears, giving the impression of having rear speakers. In practice, this doesn't quite work.

The cabling for the speakers and sub are much like a standard 5.1 setup – you just have to plug two sets of cables into the side speakers. The sub also has the option of switching between 5.1-channel and 4-channel 'gaming' configurations.

Short of cable connecting, the manual gives no explanation as to how the speakers should be set up or orientated, leaving much of the work in the hands of the user and their questionable ability to experiment. No amount of fiddling however gave the impression of a proper 5.1-setup, and if anything, sound quality was harsh when configured in this way. Changing to 2.1 was much better, but obviously, this is not what the speaker-set was designed for. The GT5051R is an admirable attempt at solving the logistical problems of a 5.1-setup. While it might be innovative, it isn't a viable alternative for the space-impaired after their surround sound fix. Either go with a dedicated 5.1 or 7.1 setup and deal with satellites or invent new ways of suspending speakers, or get a decent 2.1 set, and let the research and development continue on an alternative. LB

SCORE 7/10

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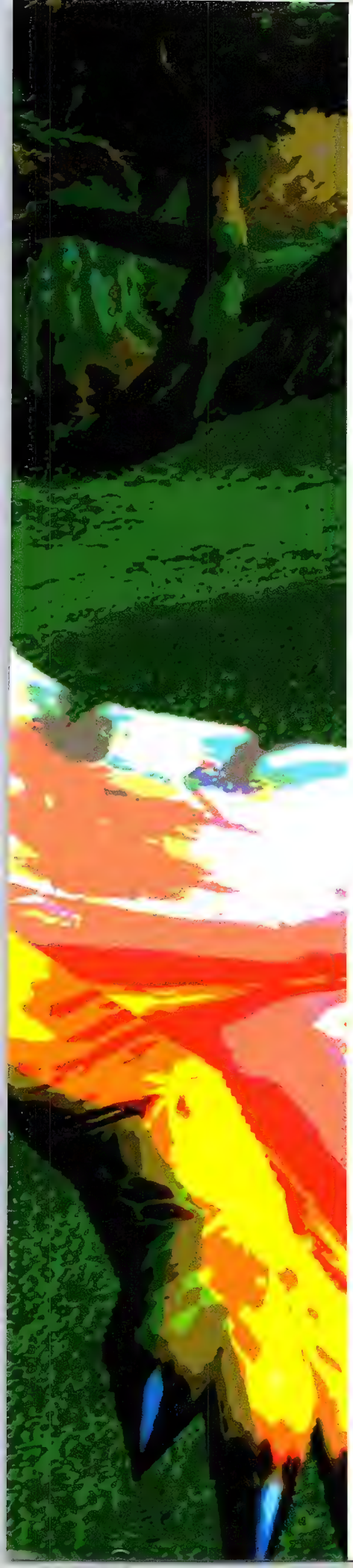

Games

The WoW factor

John Gillooly says hello to World of Warcraft and goodbye to *Atomic*.

While the excitement of the weeks leading up to Half-Life 2 was intense, and the experience itself sublime, the joy was over so quickly. Sure, Valve has now allowed gamers to lob toilets at each other, but the tight and terrific experience of HL2 single player it ain't.

In its shadow came World of Warcraft, riding a wave of hype started years ago, whipped into fever pitch by a short open beta and further fuelled by the sort of game shortages we haven't seen in years. In an era when 'do no wrong' game developers are few and far between, Blizzard has shown so very clearly that it has that special fun infusing ability that other developers like Dave Perry traded in for a bigger Ego.

Nearly all of my gamer mates have been raving about WoW, in a way I haven't seen since, well, Diablo. Long conversations revolving around races and classes have been common, in fact it's the prevalence of anecdote telling that has really marked WoW as something special.

I think though that Dave Kidd, the editor of *PC Authority*, summed it up best when he said to me that 'Blizzard hasn't forgotten that it's a game'. Which is something that MMORPG's often miss in favour of a random series of questing. There are storylines in WoW, and even though it is hugely combat focused, they give an extra depth and sense of belonging to the world.

Plus it's got that special addictiveness found only in crack, Krispy Kreme donuts and Blizzard games. It's pretty much Diablo in terms of levelling and looting, but the reward system is so finely tuned that it keeps you playing in the hope of just one more high level drop.

Once Blizzard implements its grand PvP battleground plans the game will get even better. Battlegrounds are basically an unfrucked Command and Conquer Renenegade. They are condensed battle zones, complete with a range of low and high level quests that help influence the battle. This is where the feeling of being one character in the RTS will really emerge and if it goes to plan it's going to be something special indeed.

This attention to the gameplay side of gaming was perhaps the shining aspect of 2004. It wasn't so much the sheer number of games released but the number that were actually fun to play, rather than just being eye candy wrapped around a cliché. It was also the year that gaming grew up – from the battlenet kiddies experiencing the MMORPG world for the first time with WoW, to the legitimising of games as an industry (and not just via EA's checkbook), to the increasing number of games that are too mature for our half-arsed games classification system.

Last month's *Atomic* feature on the state of game classification highlighted the fact that while change is possible, and an R rating not off the table, it will take a concerted effort by you, the geeks of Australia, to make change happen. You need to lobby your State Attorney Generals to push for change, and do it in a mature and reasonable way. It's not about the right to kill in-game hookers, it's about allowing mature adults to make their own choices in life.

To help the campaign we have uploaded the games classification feature to our website. Read it again, email the link to people and get things moving. Go and visit the Australian Adult Gamers website as well www.aag.org.au and get involved in that campaign to make a change. It's achievable, and its time to make our voices heard on the issue.

In other news, this is my last issue as Technical Editor of *Atomic*. After doing 49 of the suckers I need some time to relax, and so I'm leaving. This issue marks four years of *Atomic* on the newsstands, an achievement made possible by you, the readers. I thank you guys for supporting *Atomic* and helping us grow. I'll still be doing some writing for the magazine and I know that Ashton, Nathan and Logan have some really cool stuff ahead for the mag.

Thanks for everything guys, it has been a blast.

ShortCircuits

◂ Australia isn't the only country banning games with abandon. New Zealand recently passed judgment on Postal 2: Share the Pain, making it illegal not only to sell, but to own. Violators can look forward to huge fines, some as high as NZ$50,000.

◂ Sony and Toshiba have released more details on their Cell processor, to feature in Sony's upcoming PS3. The chip will be produced on a 90nm process, featuring 'substantial bus bandwidth to/from main memory', a 'flexible on-chip I/O interface' and support for multiple operating systems – not to mention a multi-core infrastructure allowing several Cell chips to run in parallel (the PS3 will reportedly have three).

◂ The v1.1.1286 Linux binaries for Doom 3 are now available from id Software, allowing users of the operating system to enjoy a less buggy build of the developer's shadowy FPS scare-fest. According to id programmer Timothee Besset, the update includes numerous fixes, most significantly new sound code.

◂ Just weeks after release, Half-Life 2 and Vampire: Bloodlines have been hit by a texture-loading bug. Called 'stuttering', the game takes performance hits during area loads. Valve has released a patch (via Steam), but Vampire players are still waiting for a response from Troika.

BUZZWORDIKAN

Prussia

Buried by countless wars, most of Prussia's towns now bear Polish names. First conquered by Teutonic knights in 1226, it played a key role in establishing Germany, with Prussian PM Otto von Bismarck uniting the states of the fledging nation in 1870.

Morning glory

Pyro Studios Inigo Vinos joins Logan Booker in a discussion on the developer's new strategy game Imperial Glory.

Spain-based Pyro Studios is perhaps most easily recognised as the developer behind the industry-defining Commandos – a series that to this day remains as popular as Julian Gollup's X-Com and Sirtech's Jagged Alliance. Like these games, it is a giant in its genre.

Founded in 1996 and 100 people strong, Pyro has continued to support its popular franchise with a number of sequels and expansions including Commandos 2: Men of Courage and Commandos 3: Destination Berlin. Now, with the title of isometric strategy master under its belt, the studio is looking to expand into other genres. Right now, it's turn-based empire building.

Imperial Glory is the studio's second foray into the market – it's also behind another strategy title, Praetorians. Although this title continues to be played online, it unfortunately hasn't enjoyed the same success as Commandos.

Starting from scratch with Imperial Glory, Pyro has combined elements from Creative Assembly's Total War series and Firaxis' Civilization – and it definitely looks to ruffle as many feathers as it does flaunt them. According to Pyro Studio's Marketing Manager Inigo Vinos, the title has come a long way in its two years of development, the engine developed from scratch, built by a dev team of 28. The game's primary features are its extensive diplomatic and economy models, as well as its land and naval battles. Combat occurs over a variety of landscapes, including deserts, grassy hills and snow-covered castles. Units are all rendered in 3D, each model featuring a slight variation, such as holding a weapon differently or marching a little out of order, adding some realism to the proceedings, and although it couldn't be confirmed, looked like use of geometry instancing, a feature available on next-generation 3D accelerators.

As for the game itself, players will have the opportunity to choose from five sides: Great Britain, France, Austria, Prussia and Russia, with each side bringing its own unique feel in terms of dialogue, location and objectives, as well as special nation-specific units. In addition, the single-player campaign is comprised of three ages, each age affecting research tree options. As each age transpires, the player will have the option of changing their government types, with options such as democracy and dictatorship available. Set in Europe, the game starts at the beginning of the French revolution and covers several key moments in the history of the continent.

Where Imperial Glory really differentiates itself is in the areas of conquest and expansion. Players will be able to take over countries by influence and diplomacy, rather than just combat. By performing certain activities, such as providing resources or helping neutral nations defend against invaders, you'll gain a positive 'influence' in those nations. Eventually, with enough nurturing, these nations will join your cause. Obviously, nothing stops your opponents from doing the same thing to your nations, so it's important to keep up the status quo and not ignore the needs of your budding empire.

When it does come down to duking it out though, Pyro has gone to great lengths to make combat an engaging part of the game, more so than it would normally be. For instance, to discourage players from building massive numbers of units and sending them off to battle, the game restricts the amount of forces you can dedicate to a fight – at the moment the limit is set to three. Restrictions are also placed on how many troops each leader, or 'Captain', can lead, a restriction that lessens as they gain experience. It then becomes important to ensure your most experienced leaders stay alive, providing even more strategy for the player. More spice comes in the form of naval combat, and although it's still being tweaked, it will add some much needed freshness to the genre.

At the moment, Imperial Glory is set for an April 2005 release, and will feature multiplayer for up to four players.

Developer Quote of the Month

'The nice thing about the Hollywood film style is that I can explore multiple character perspectives, whereas game stories are limited to one perspective for game play.'

American McGee on his yet to be produced game-come-movie, Oz. Crap detectors on standby.

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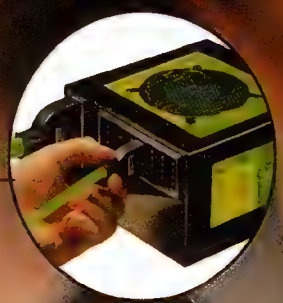

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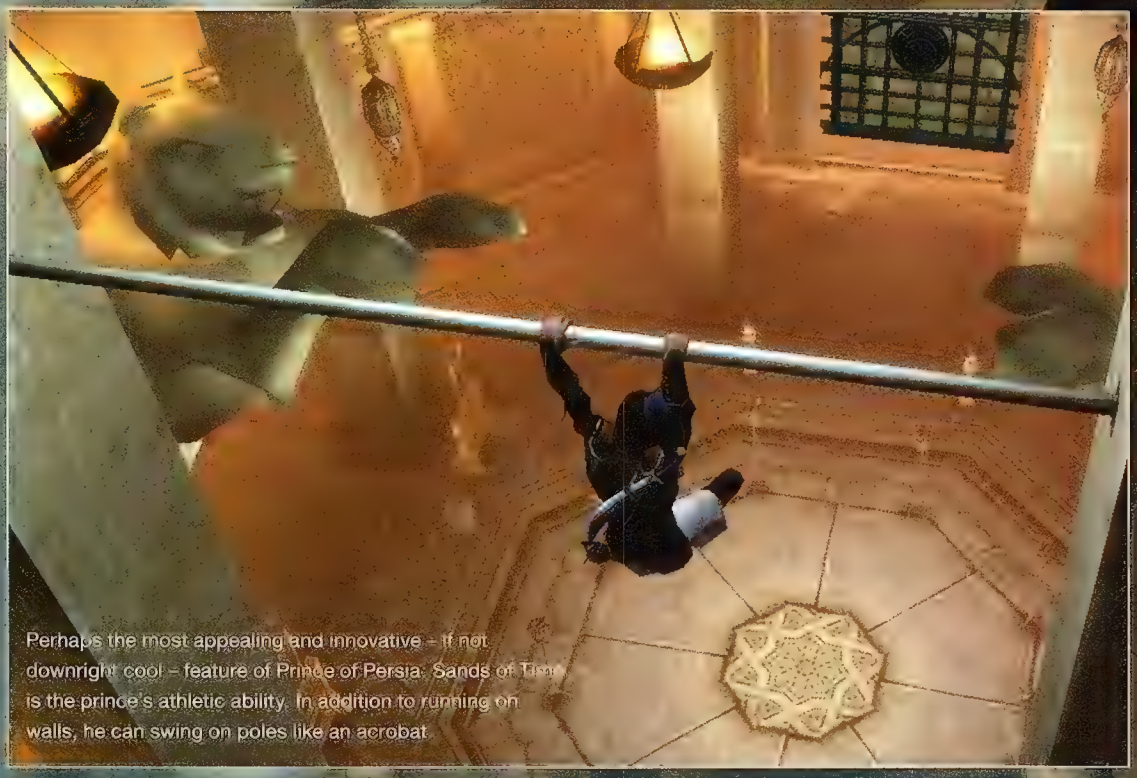
Made with Jade

Logan Booker questions Ubisoft's Christophe Beaudet and Marc Defosses on Jade, the engine behind Beyond Good and Evil and Prince of Persia.

Jordan Mechner's original Prince of Persia was a 16-colour, 2D platformer that remorselessly tossed the player into a world of unstable boardwalks and sword-wielding skeletons, where the protagonist – an unfairly convicted prince – was forced to risk life, limb and health-boosting amphorae to save an exotic, fun-loving Persian princess from an evil sultan and untimely fate.

Exciting really doesn't do Broderbund's 1989 classic justice, and indeed, no-one could do it justice until 2001, when Ubisoft decided it was about time the title saw a refresh. There was, however, work to be done before the new game could be realised – the main point, of course, was getting some whiz-bang technology off the ground to power the title.

It should come as a surprise then that the engine tech for Prince of Persia: Sands of Time, the successor to the original game, was developed a few years before the game itself. The engine appeared first in another Ubisoft title – Beyond Good and Evil. Called 'Jade', the technology is named after the main character in



Perhaps the most appealing and innovative – if not downright cool – feature of Prince of Persia: Sands of Time is the prince's athletic ability. In addition to running on walls, he can swing on poles like an acrobat

BG&E. The game was heralded for its wide open areas and gameplay that melded many subtle mini games into the one seamless experience. However, according to Christophe Beaudet, lead designer at Ubisoft's Montpellier studio, it is from a developer's standpoint that the technology really shines.

'The most important feature of the Jade Engine is its "all-in-one" tools that...take care of almost the entire development of a game – from modelling to generating the final version,' Beaudet says.

'These tools are very flexible, which allows us to do a lot of testing during our pre-development phase. The water in BG&E, for example, was very complex to create and use, but the result was worth the effort.'

Beaudet explains that Jade began development even before BG&E, with work starting as early as 1998. Since this time, the team has been constantly adding new features and capabilities to the technology, the culmination of this work featured in Prince of Persia: Warrior Within, the sequel to Sands of Time.

'We wanted to build tools and a 'next-gen' engine that could survive the future generation platforms,' Beaudet explains. The technology for the engine was created entirely in-house, including the physics, sound and almost all the graphics engines. The only exception is the graphics engine for the GameCube version, which was external, and the team has plans to use 'strong external physics engines' in future projects.

Currently, there are no plans to license the technology outside of Ubisoft.

Princely sum

Interestingly, Jade wasn't the only engine considered for Prince of Persia. Marc Defosses of Ubisoft's Montreal studio – the dev house that worked on PoP – mentions that RenderWare (Grand Theft Auto 3), Unreal (Unreal Tournament 2004) and Virtus' OpenSpace were also looked at.

'Developing our own engine was never considered,' he says. 'It took approximately three months for the programming team to get used to the [Jade] engine. At the end [of this time] and with the proper training, an artist could learn the basics within three weeks.'

Jade was, in fact, so easy to use that the demo Montreal showed at E3 2003 was mostly complete. For a game that only went into production

towards the end of 2002, this was an exceptional turnaround for development.

While the technology was a breeze to use, deadlines forced the team to drop features from Prince of Persia. Montreal wanted a game that 'focused on human acrobatics and fighting', the emphasis placed on telling a strong story. The team also wanted to accentuate the feeling of 'one place, one time, one action' according to Defosses. This is realised to a large extent with the heavy use of time manipulation in the game – a concept which added a pliable amount of depth to a genre that normally focuses on frenetic gameplay that doesn't let up until the last enemy falls.

'One of the main features we had to drop early was the high amount of interactive ingredients we had first planned. It was just too much; we had like 800 different states to do,' he says.

'At first we wanted...more enemies at the same time on-screen – like 10 instead of four or five. Another thing we wanted to include was some friendly NPCs that would transform into Sandmen [in-game enemies].'

'But for the time constraint, we had to drop it,' Defosses explains.

Although there are no external projects in the works using Jade, Defosses says there are several titles currently in development using Jade at Ubisoft. Of course, they have yet to be announced.

Beyond Prince of Persia

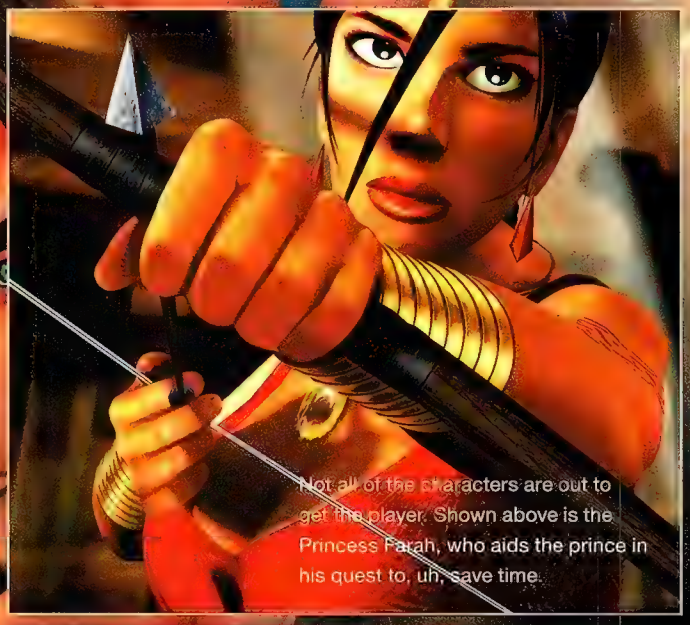
According to Beaudet, Jade really is the studio's prime technology, and when he says it was developed with the future in mind, he means it. Other genres are definitely approachable with Jade, and the Montpellier studio is already working on new features to keep the engine flexible and up to date. Jade can be easily adapted for first-person shooters as well as other games.

'For games that require more physics – like car games – not yet, at least not until we have finished our new implementations,' Beaudet explains. 'Also the Jade Engine does not have a network engine yet.' Obviously, until this is developed, multiplayer games over the internet or other means are not possible.

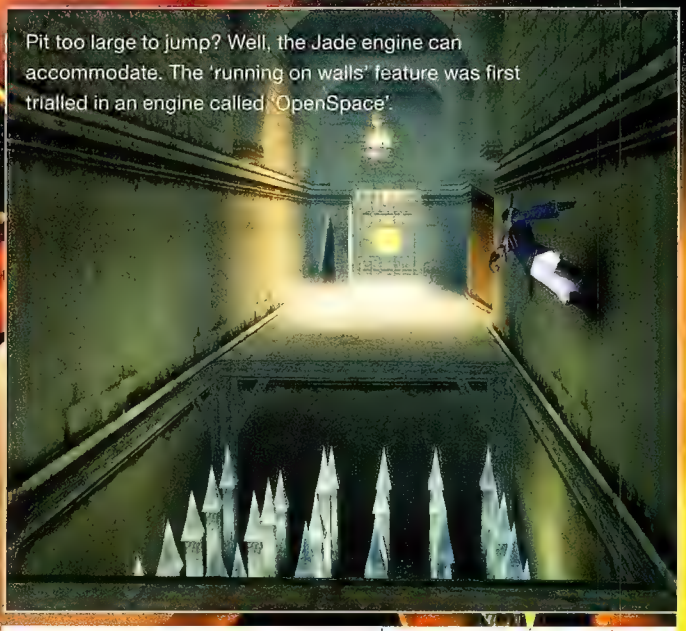
Jade also proved to be a learning experience – both BG&E and PoP are multi-platform titles. 'Each platform is particular – PS2 being a bit slower but having more memory, GameCube being faster but having less memory etc. It is not always easy to deal with these sometimes contradicting constraints between each platform.' Beaudet was unsurprisingly direct when it came to naming the platform that was the hardest to work on, his opinion mirroring that of many other developers.

'Without a doubt, the PS2.'

Here's hoping that the PlayStation 3 proves to be a friendlier platform for Jade.



Not all of the characters are out to get the player. Shown above is the Princess Farah, who aids the prince in his quest to, uh, save time.



Pit too large to jump? Well, the Jade engine can accommodate. The 'running on walls' feature was first trialled in an engine called 'OpenSpace'.

Like all games, Prince of Persia: SoT had its fair share of concept art. Shown here is the palace in which most of the game takes place.

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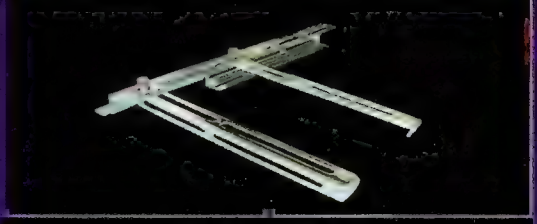

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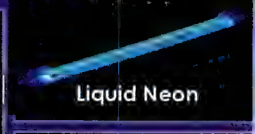

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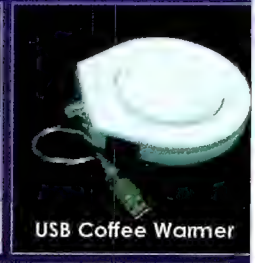

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Logan Booker of the Riddermark rides for wrath, ruin and the Red Dawn.

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☺ Impressive onscreen unit counts; great story, music and sound; refreshing gameplay mechanics combined with solid RTS mechanics. Audio and movie clips from the films.

Game balance issues thanks to Total War mechanic; graphics engine is good but not spectacular; some small AI issues. Could be considered 'RTS-lite' by some.

Lord of the Rings: The Battle for Middle-Earth is the latest opus from Westwood's successor EA Pacific. Using a massively overhauled version of the Sage engine technology that powered C&C: Generals (Engine Room, *Atomic* issue 45), Battle for Middle-Earth has the player controlling a range of organic, emotion-driven units from the courageous Rohirrim riders of Rohan and the tireless armoured troops of Gondor, to the foul orcs of Isengard and the fearsome flying Fell beasts of Mordor. Of course, fighting in the frey are the heroes of these factions, including Aragorn, Saruman, Frodo and the Witchking. Like Warcraft, these heroes have their own special abilities that turn the tide of battle more often than not.

ABOVE: The game is much more than just command and conquer with orcs.

The single player component hails back to the days of the old C&C, but with a nice difference. Presented with a map of Middle-Earth, known in-game as 'The Living World', the player must move their armies into threatened territories and defend them from invaders. Each freshly secured territory provides the player with either a resource bonus, command points that increase your unit cap, or 'power points' which can be spent on global in-battle powers, such as mass healing or Balrog summoning.

In-between this lightweight Total War mechanic, the player will also occasionally control – if they're playing the good campaign – the Fellowship. Although presented in the same manner as normal battle, these sections play more like a mini-RPG, adding some refreshment to the normal RTS mix.

Multiplayer is nothing amazing, and if you've played C&C: Generals, the presentation is much the same. Standard 'versus' modes are available along with team battle options.

Like many recent RTS titles, TBfME adopts a 'battalion' system of unit control. Mainstay troops like archers and footmen are built in squads while siege weapons and similar are built singularly. Lost troops are replenished slowly over time, depending on whether the unit has reached the right level of 'veterancy' and, as long as the battalion survives, it will grow in experience. This becomes a worthwhile endeavour as troops are carried on to future missions, and some missions allow you to call in other armies as reinforcements, making it important to maintain well equipped, veteran troops.

Base building is also different from your regular RTS. Instead of building producers and upgraders haphazardly, each 'town' has a certain number of plots in which to construct structures.

For the most part, there is no resource gathering, and structures such as farms and slaughter houses produce resources, of which there is just the one, at a steady rate. Depending on the size of the town centre – outpost, town, castle, etc – more plots are available.

Graphically, TBfME is impressive. While not as beautiful as a title like Ground Control II, the game makes its mark thourgh its capability to render large numbers of units at once. Thanks to an efficient dynamic LOD system, the new and improved Sage engine is capable of rendering bugger-loads of troops, making battles like Helm's Deep and Minas Tirith scary affairs.

The game does suffer from a few problems. While acceptable, the AI isn't ungodly impressive and game balance is always an issue – it depends heavily on how good you are at keeping troops alive between missions. Some RTS players may feel TBfME is a little light on the unit variety and strategy counts, however, once you've played it for a day or two you'll find the reduced choice is actually a bonus – instead of building a couple of unit types among many, you use all of them more effectively.

Battle for Middle-Earth is an accomplished title from the former Westwood Studios. Sage is looking ripe for the recently announced Red Alert 3, and TBfME shows what the engine is capable of. Although it may at first put off veteran RTS players, the game is easy to get into and, if you're willing to give it a chance, it's addictive and fun.

Requirements
1.3GHz CPU; 256MB RAM; 32MB DirectX 9-compliant video card.
Recommended
2.0GHz CPU; 512MB RAM; 256MB video card.

SCORE **9/10**

World of Warcraft

Take a trip to Kalimdor with John Gillooly.

PC Specs

Developer:
Blizzard
www.blizzard.com

Publisher:
Vivendi Universal Games
www.vugames.com.au

Distributor:
Vivendi Universal Games
www.vugames.com.au

Phone:
Vivendi Universal Games
(02) 9978 7722

Rich world to explore, addictive gameplay.

It is still an RPG, which will put some people off. It is also highly combat focused.

ABOVE: Hunters trying to sate a hungry pet should try fishing for food.

ABOVE: Major locations in WoW are joined by air transport routes for quick trips.

I've been roaming the Barrens for some time now, working centaurs, razormanes and raptors. I'll occasionally swing down to the coast, or east to the south fury river, to throw in a fishing line. My pet Crocolisk, Snookums, has taken a liking to fish, and Crocolisks can be temperamental beasts when hungry. I'm a level 16 Orc, a Hunter, the ranged combat class in World of Warcraft, Blizzard's massively multiplayer opus.

After a long beta period which culminated in around 500,000 people taking part, World of Warcraft launched to amazing success, but initial enthusiasm aside, an MMORPG lives and dies on longevity and depth which begs the question of whether WoW has the goods to survive in a very crowded market.

WoW is probably the most polished and newbie-friendly MMO released so far, and is an amazing accomplishment for a company's first true RPG, let alone MMO. It draws on the experiences of previous titles like Diablo and Warcraft to build something both nostalgic and fresh.

It actually uses the same graphics engine as Warcraft 3, but spruced up. Unlike its main competitor Everquest 2, which goes the ultra realistic visual route, WoW keeps the cartoony look of the strategy games on which it is based. This also means that it's friendly to lower end systems than EQ2.

For a world based on a realtime strategy game, WoW has a surprisingly deep backstory, thanks largely to the epic tale behind Warcraft 3. Its great success is in making you feel like you are part of the world, which is surprisingly difficult to do. It is a strange fantasy place, with a slightly steampunk vibe thanks to the inclusion of guns and skills like engineering. It is also enjoyable to play solo or in a group, drawing on the Diablo legacy.

Character development follows a fairly standard model, you gain experience by fighting and completing quests. When you level up you can then buy new skills from trainers who can be found in cities. Hunters and Warlocks can also acquire combat pets which gain experience and can be trained in new skills. Once you hit level 10 you also access the very Diablo-esque talents system. Talents augment skills, with one talent point per level, which can be chosen to complement your play style.

Being an MMO no matter what character race and class you are, you will end up running around killing low level creatures for a while. These missions are well paced, and you level up quickly as you go. It provides a nice training ground and lets you start getting an idea of the overarching plot of the game and the best play style for your character choice.

At various locations in the worlds of Kalimdor and Azeroth you will find profession trainers. These people can teach you up to two main professions such as skinning, mining, herbalism, engineering, and blacksmithing. You can also learn secondary professions like cooking and fishing, which are handy when tending to pets as a hunter. You can increase your skill in a profession by using it and higher levels let you learn better skills and formulas.

As you progress through the game you will find the game leading you through areas appropriate to your character level, and this is augmented by little touches like the colour coding of quests in your log based on difficulty and the gradual discovery of long distance travel routes to make your journeys around the world a little easier.

Overall Blizzard has created a great time suck with WoW. The sheer vastness of the world is amazing, and there are many, many, many hours of play to be had to reach the current level cap of 60. It looks great, plays great and just feels right. If you have never played an MMO before or feel like a change from killing rats then this is a very worthy way to spend your gaming time.

Requirements
800MHz CPU; 256MB RAM; 32MB DX7 or above graphics; broadband internet; US$14.95 monthly subscription fee.
Recommended
1.6GHz CPU; 512MB RAM; 64MB graphics.

SCORE 9/10

hotaward

EverQuest II

Ashton Mills finds adventure again in the latest of the Evercrack franchise.

PC Specs

Developer:
Sony Online Entertainment
www.sonyonline.com

Publisher:
Sony Online Entertainment
www.sonyonline.com

Distributor:
Ubisoft
www.ubisoft.com.au

Phone:
Ubisoft
(02) 8303 1800

☺ Fantastic gameplay design, stunningly detailed world, a true successor to EverQuest.

☹ Need a beast machine to truly appreciate, zoning still sucks.

ABOVE: Mounts like this horse are a big part of the game for higher level characters.

ABOVE: As with the original EverQuest, teaming up with other players is a key element.

What can I say? This game is good. It's good in all the ways that slamming your fingers in a door isn't. It's fun, it's addictive, and after Doom 3 and Half-Life 2 it's the single biggest reason gamers the globe over are spending cash to upgrade their machines.

Fun-filled e-crack addiction aside, it's the graphics engine that is both the highlight and the Achilles heel of EQ2. Making full use of pixel shaders, specular lighting, realtime shadows, loads of high resolution textures and massive outdoor vistas this is the one game this year that will well and truly make your beast machine investment feel like a pocket calculator – at least if running on maximum detail, which everyone naturally tries to do at least once to see *just how good it looks*. Thankfully, there are a variety of detail levels to ensure your game looks gorgeous *and* remains playable.

But EverQuest 2 is more than just a graphically advanced version of its predecessor, it's a clever evolution of a classic formula. EverQuest had an almost perfect mix of exciting exploration, a sense of personal achievement and reward, and a heightened sense of accomplishment due to the way death was handled. As you'd expect, SOE has built upon what worked while changing what didn't.

For the most part, the changes are good – death for example is less painful, though still holds a penalty through an experience 'debt'. There are a huge variety of races and classes, 16 races and 24 classes in all, and a new development system that lets players choose new classes at milestones in their development. A fighter for example can progress from Warrior to Brawler or Crusader, and branch out twice more from there. It's a very cool system, and allows you to plan ahead with character development. Trading and a new broker system revolutionises the economy and allows players to create their own – presumably one that doesn't spiral out of control as with the original EverQuest.

Since preview of EQ2 in Issue 47, a number of features have changed. Instead of grouping all new players onto a single Isle of Refuge newbie zone, there is now an Isle of Refuge for each of Qeynos (representing good) and Freeport (evil). This returns a little of the mystery in discovering other races as you progress through the game. The promised Traits, Traditions and Tactics are in, but don't quite add as much diversity to your character development as SOE probably hopes. And special abilities called Heroic Opportunities now work a little easier and allow group members to build on each other's skills, and when performed in the correct sequence, to perform heroic feats (which largely translate to high damage attacks or buffs).

Each city contains suburbs for each of the core races in Norrath, and exploring them can be as much an adventure as exploring outside their protective walls. Qeynos generally reeks of good nature so strongly you feel like you're watching Teletubbies at times. Freeport, by contrast, is populated by grumpy and violent NPCs, and the very walls and colour of the sky speak of a dark and dangerous city. If you really want to escape into an alternative world, Freeport is a fantastic example of how good MMOGs can be.

While PVP plays no part in EQ2, the two cities are at odds and entering the lands of the other will provoke attacks by their NPCs. It's possible, though, to undertake a betrayal quest that culminates in a long journey crossing borders and defecting to the other the opposing city.

EverQuest 2 succeeds where it matters most. It provides a huge, detailed, and populated world to explore while providing that familiar addictive experience of leveling, powerful items, and the development and ultimate success of your character. Make no mistake, EQ2 deserves the e-crack moniker as much as its predecessor. If you decide to enter Norrath, head to the unofficial Australian server, Najena. See you on there!

Requirements
1GHz CPU; 512MB RAM; DirectX 9 compatible 64MB graphics card.
Recommended
2GHz CPU; 1GB RAM; DirectX 9 pixel and vertex shader compatible 128-256MB graphics card.

SCORE **9/10**

Sid Meier's Pirates!

John Gillooly dons his puffy shirt and grabs hold of his cutlass.

PS2

Specs

Developer:
Firaxis
www.firaxis.com

Publisher:
Atari
www.atari.com.au

Distributor:
Atari
www.atari.com.au

Phone:
Atari
(02) 8303 6800

☺ That weird Sid Meier magic at work. Pirates!

☹ Not for those after twitch action.

ABOVE: Swordfighting is one of the mini-games to be experienced.

ABOVE: Ship to ship combat takes place in realtime and can be highly tactical.

One wonders why there aren't more games made about pirates. Such venerable titles as Secret of Monkey Island and Sid Meier's Pirates! brought the acceptable kind of game piracy to the fore, but few other developers have dared come near pirates as a subject matter.

Perhaps it is the general taboo nature of the word piracy in game development, or more likely it is just because developers feel they cannot live up to such a swashbuckling legacy. It is a debate that will probably never truly end. But thankfully creator Sid Meier and his company Firaxis have returned to the Caribbean and remade the classic title in the form of Sid Meier's Pirates!

Yeah it's confusing and if Sid Meier wasn't so well known for being magnanimous when praise fell on him it could be seen as somewhat egotistical. But Firaxis has already proven itself a great developer and its Pirates! Remake is well up to scratch.

It is a potentially car-crash like mix of strategy, RPG-lite, ship combat and arcade mini-games. But it works wonderfully and delivers a game that is both enjoyable and replayable.

The game takes place in an isometrically rendered replica of the Caribbean during the 1600s. After an intro movie that explains your revenge driven ways and journey to the new world, you are given control of a single ship. From this very first moment the gameplay is freeform. You can choose to align yourself with certain nations, and then take it upon yourself to try and change the balance of power in the region.

This part of Pirates! is surprisingly deep. You can have a serious impact on how the game evolves through your actions. If you wish to wage war against an enemy capitol then you can first loiter around taking out supply ships or troop transports. Or you may prefer to target all nations indiscriminately and live the pirate life.

Because so much in the game is the result of subtle influence it almost seems simplistic to start. If you sit back and don't take part then settlements still evolve, enemy ships still battle and pirates still raid, you can have as much or as little involvement as you want.

Because of the heavy reliance on sail the wind direction in the game plays an important part. Sail into the wind and you will find it heavy going, so sailing techniques like tacking come into play. Wind influence also extends to sea based combat, where the camera zooms in and you battle it out with an enemy ship or ships.

How combat plays out is up to your ship type and play style. Ultimately you want to weaken and then board the opponent's ship so you snaffle up his cargo, maybe recruit new pirates to your crew and even decide whether to keep or sink his ship. You can only control one of your ships in combat, but you do get a chance to choose beforehand.

When you board an enemy vessel the captain may attack, triggering a simple swordfighting mini-game where you can choose one of three attack or defence moves.

It is quick and intuitive to play, like the other mini-games which crop up in Pirates!

The other main mini-game comes into play when you impress a town governor enough that he lets you dance with his daughter at a ball.

You will need to choose your moves based upon the directions given by your dance partner, and move in time with the music if you want to make the best possible impression.

What really ties everything together though is the amazingly well done graphic style of the game. It conjures nostalgia for days gone by whilst providing a swathe of subtle feedback effects that help gameplay.

If you turn into the wind your sails will flutter, twist away and they will puff up as the wind begins to fill them. See a fluffy white cloud drifting by and you can use it to temporarily accelerate your speed.

Sid Meier's Pirates! is a delightful game, mixing up so many genres but still managing to stay unique and refreshing.

It does suffer a little from keypad based control, but this is more a case of control being different rather than unnatural.

Overall Firaxis has created a game that will please both those who are pining for a return to childhood joys and those who are stumbling across Pirates! for the first time.

hotaward

SCORE 9/10

Alexander

Logan Booker thinks Alexander isn't so great.

PC Specs

Developer:
GSC Game World
www.gsc-game.com

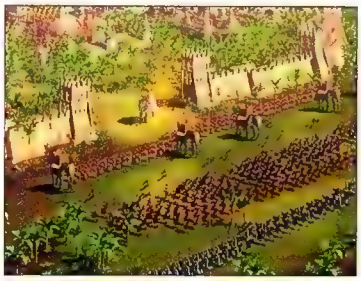
Publisher:
Ubisoft
www.ubisoft.com

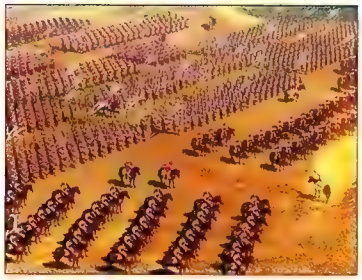
Distributor:
Ubisoft
www.ubisoft.com

Phone:
Ubisoft
(02) 8303 1800

☺ Great graphics and epic battles. Loads of units onscreen.

☹ No shine – looks rushed. Strategy elements non-existent, some game mechanics like formations irrelevant. Poor voice-acting and bad spelling.





ABOVE: Gather the units and rush!

With a title like S.T.A.L.K.E.R.: Shadows of Chernobyl in the works, you'd think that the developer, GSC Game World, would take as much care with its other titles as it does this premium FPS extravaganza. Alexander, GSC's latest release, not only shows us that the trend of 'games plus movie tie-ins equals suck' is alive and well, but that even quality developers can do dodgy titles from time to time.

The game covers the life of Alexander the Great, conqueror and man's man. Rallying the forces of Macedonian, it's up to the player to attack races ranging from the Greeks to the Egyptians, while completing various side quests to further Alexander's story.

The player controls standard units as well as heroes, in what has become the norm for RTS games. Troop choices include warriors, cavalry, archers and, depending on the side that you're playing, sling-men. Each can be assigned different formations that improve their ability to fend off opposing units, however, they seem to have little to no effect and the best strategy is to simply attack with lots of units as hard and as fast as you can. Your unit AI is depressing at best, the only thing more shameful being the AI of the computer. On many occasions it will fail to defend itself, putting up only token resistance. Depending on how aggressive you are, mission lengths can range from a few minutes to an hour, leaning on the side of the former. When you're not vanquishing thousands of inept foes on the battlefield, you'll be combating the dullness of the game's side adventures.

Additionally, the voice-acting is really quite bad, and although a game can get away with a few spelling mistakes, errors are littered throughout Alexander.

These failing qualities combined reek of a rushed release, or one that didn't have as much attention as it should have paid to it. Regardless, Alexander is an average title, much like the movie from which it was spawned.

SCORE **6.5/10**

Metroid Prime 2: Echoes

Ron Osborn can't put down his power beam.

PC Specs

Developer
Retro Studios
www.retrostudios.com

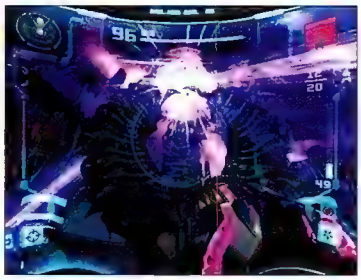
Publisher:
Nintendo
www.nintendo.com.au

Distributor:
Nintendo
www.nintendo.com.au

Phone:
Nintendo
(03) 9730 9822

☺ A healthy blend of atmosphere, adventure and action.

☹ Joypad gymnastics can be a chore.



ABOVE: Samus is back to save the world from purple glowy things.

With the recent spate of big name sequel releases on competing platforms – Half-Life 2, Halo 2 and San Andreas, just to name a few – it's starting to look a little deserted over in the Nintendo camp. Thankfully, Metroid Prime 2: Echoes gives GameCube owners a slice of big sequel pie.

This time around, lack of roadside assistance sees Metroid heroine, Samus Aran, stranded on war-torn planet Aether. A meteor impact has replicated the planet across two dimensions – light and dark – and war between the inhabitants of each dimension has erupted. The light and dark dimension jumping is pretty much a means for the developers to get extra mileage out of the same levels but this can be forgiven as it's done so well.

The game environments look incredible and though there are no large open areas, you'll appreciate the complete lack of loading time as you explore the caverns and compounds of Aether.

Power-ups and tough boss fights are a trademark of the Metroid series and Echoes is no exception. New in this game are two weapons – the light and dark beams. These ammo-limited variants of the default power beam are quite effective at vanquishing enemies from their respective opposing dimension. The ingenious ammo pick up system for your beam weapons actually encourages you to use your weaponry. Destroy an enemy with your light beam and recover dark beam ammo, and vice versa.

Rarely straight out shoot-fests, boss battles can be a cause of frustration until you figure out just what it is you're supposed to do. It's this situation that highlights perhaps the game's only fault. The Gamecube controller is an awkward apparatus and though the target lock system does make up for the game's lack of circle strafe, you may find yourself in need of a helper monkey as it's quite a task to get your paws around the jump-strafe-charge-missile button combinations necessary for some of the more involved boss battles.

Echoes is a solid addition to the Metroid series. It's atmospheric, challenging and rewarding – as well as damn addictive. There's lots to explore and the incentive for 100 percent completion will ensure that there's replay value. Chalk up one more reason to own a Gamecube.

hotaward

SCORE **9/10**

Nexus: Jupiter Incident

Logan Booker explores the final frontier.

PC specs

Developer:
Mithis
www.mithis.hu

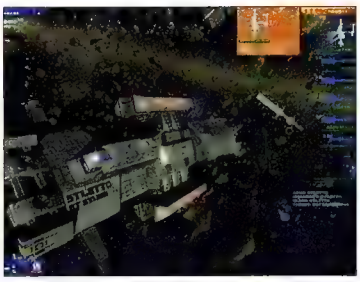
Publisher:
Vivendi Universal Games
www.vugames.com.au

Distributor:
Vivendi Universal Games
www.vugames.com.au

Phone:
Vivendi Universal Games
(02) 9978 7722

☺ Gorgeous graphics; strategy and light micromanagement; outdoes Homeworld.

☹ Gameplay is slow; natural darkness makes some objects hard to distinguish; voice-acting varies – OK to disturbing.



ABOVE: Shadows, ships and space. How wonderful!

Although the spiritual successor to the second game in the Imperium Galactica series, Nexus: Jupiter Incident does not share much with its predecessors – if by 'much' you mean 'nothing at all'.

For one, Nexus is the work of a company called Mithis, not IG's original developer Digital Reality. The strategy elements found in other IG games – taking planets, building ships, saving damsels, etc – are absent and the somewhat dull standard fleet management system was abandoned in favour of a Homeworld-like engine/interface.

What this has accomplished is increased appeal. Homeworld is a great game and emulation is the best way to cash in on its success.

However, Nexus is by far a better looking game, incorporating normal maps and dynamic shadows to create an entirely believable spacescape.

As Marcus Cromwell, captain and all-round nice guy, the player is tasked with controlling multiple battleships as they progress from mission to mission saving people from horrible deaths and collecting resource points to spend on better armaments. While there's a huge emphasis on making Nexus the most beautiful space RTS in the galaxy, Mithis has also made sure it's a solid game. Blending strategy and micromanagement, the player is forced to keep a close eye on ships systems, which you can activate and deactivate at will, as well as issuing orders and moderating aggressiveness settings. The game throws up the odd moral question and command choice, requiring the player to travel down different paths during the course of the single player campaign.

Nexus unfortunately is an incredibly slow game. Battleships take many minutes to move into firing positions, and travelling between waypoints can drag even the most dedicated strategy player into a slumber. There's no time compression setting, which would have been a godsend. The lighting at times can also make details hard to distinguish and while realistic — it is space after all – it can be a little frustrating.

Nexus will satisfy Homeworld fans, but the lack of an empire-building component will disappoint IG aficionados. It is nonetheless an engaging and graphically gorgeous game.

SCORE **8/10**

Call of Duty: Finest Hour

Nathan Davis pegs a 'nade at his feet and calls it his finest.

X-BOX specs

Developer:
Spark Unlimited
www.sparkunlimited.com

Publisher:
Activision
www.activision.com.au

Distributor:
Activision
www.activision.com.au

Phone:
Activision
(02) 9869 0955

☺ Intransigent console FPS fans; adequate console port; great birthday present.

☹ Nothing new; linear story; some frustrating controls.

ABOVE: All the 'compensating for something' jokes eventually got to Joe.

There's no doubting Call of Duty is a popular PC title. Considering this, there is little wonder the ostentatious marketing mice pushed it to the console. Hell, Counter Strike found its way there. Although, 'popular' would be an understatement for that demon.

The inevitable predicament with FPS games on the console is the controls. The non-keyboard/mouse set-up has people running like rampant tub girls, who are fazed purely because accuracy is paramount. The unbeatable fusion of keys and rodent provides just that. There is a myriad of game controllers for computers, but playing shooters on the PC with such a device is heretical and we've heard it contracts brain haemorrhoids.

This game was not made for a hand controller, but they've managed to make it work. Mostly. The controls for movement have been implemented surprisingly well, making way for the exception of some button set-ups. For example, the default option has the grenade throw button and aim control on the one side, leading to trying – yet severely hilarious – acts of anti-self-preservation, particularly when running in multiplayer.

The thin single player story is yet another predictable WW2 plot. As it's pretty much a direct port with new maps and the usual works, there's no co-op – but this is the console, dang it. Had this been implemented, that could have *made* this game something special.

On Xbox there are two options for multiplayer – System Link and Xbox Live, of which the latter is already infested with elite headshot kiddies.

Perhaps slightly biased towards the PC version, we found the multiplayer experience limited by the controls available.

Overall, as much as we like to poke at it with our hot damnation rod, there's nothing intolerably wrong with this game. It just fits too many existing bills – World War II game, check; first person shooter, check; nothing new, check. But what truly is? These days a great game all comes down to the slightest ingenuity. But this game doesn't have any particularly recognisable feat.

If you have the PC version, it's relatively pointless, but if you're done with Halo 2 and haven't played Call of Duty, this console port may well be up your axis.

SCORE **7/10**

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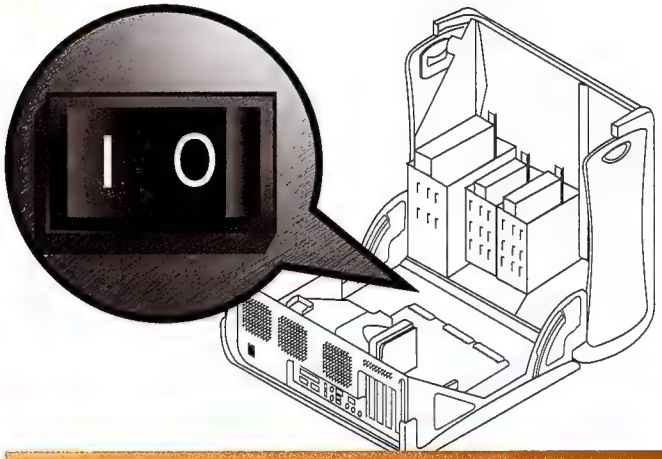


IO of the month wins a Logitech MX510!

More accurate than an aimbot!
io@atomicmpc.com.au

IO OF THE MONTH

Disk swapping

I have recently acquired a server and was looking to make it into a dedicated games server. I'm currently in a meaningful discussion with some friends regarding the fastest configuration of the drives.

The server has three 74GB 10,000 rpm HDs on an Adaptec RAID controller. Should I use a RAID 1 mirrored set with a separate page file disk, or should I just stay with the RAID 5 disk set and take advantage of the security and space it provides? Is a separate paging disk going to increase the performance of the server?

Brett Duguid

ABOVE: Just one of these probably can handle serving games, you know.

Unless the server's actually flogging its swap a lot, the difference will not be noticeable. A game server certainly *shouldn't* be hitting the disk during normal operation except on level transitions; even a mere 1GB of physical RAM should be enough to accommodate the four or five different dedicated server executables that'll swamp the upstream bandwidth of most internet links.

If this is going to be a LAN server then bandwidth shouldn't be an issue, even on plain 100BaseT Ethernet. But if you install 2GB of RAM, you'll still probably run out of CPU power before you run out of physical memory, even if you've got a steaming dual processor system.

This depends on the games you're running, of course. A lot of game servers have surprisingly light system requirements; if you only want to run *one* dedicated server, a superannuated ex-business 400MHz P-II box can still handle most of what people are playing today (though probably not a big BF1942 game).

With a good controller, RAID 1 (mirroring) and RAID 5 will both give you considerably improved read performance, which is what you want. There won't be a noticeable difference, for your purposes, between two-drive RAID 1 and three-drive RAID 5. There also won't be any difference in total disk capacity; either way you're giving up one disk worth of capacity for data protection, though the RAID 5 option gives you redundancy for *all* of your data if one drive fails, while the RAID 1 option only protects the mirrored disks from one of *them* failing.

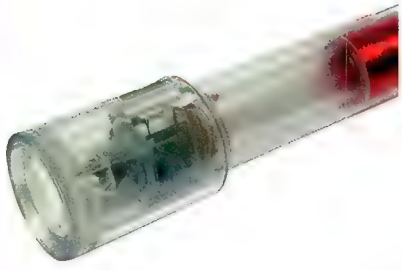
If all you're considering putting on the third drive is the page file, though, then this could actually be a plus. If it's not RAIDed at all and it fails, you'll be able to swap it out quickly and easily without having to do any RAID rebuilding.

You will, of course, have tons of disk space left over on the machine, if all it's doing is serving games. Consider using only one drive for everything; any 10,000RPM drive really is likely to be perfectly adequate. Then you could use one of the others as a nightly or weekly backup disk, and keep the third one to swap in if one of the others fails. Sorted.

Shake shake shake, shake your mousie...

After I found out about A4Tech's BatteryFree Wireless Mouse, that gets power from its mousepad, I had a better idea. Why not have the mouse be powered by the user's wrist movements? Like Seiko's 'Kinetic' watches, which don't require changing of batteries. I'm pretty sure the same could be done for a mouse. After all, you *have* to move the mouse to move the cursor.

Siriuz



ABOVE: You shake this flashlight to charge it, but I wouldn't want to shake a mouse like that.

There's a big, big difference between the power you need to run a wristwatch and the power you need to run a mouse.

There's a big, big difference between the power you need to run a wristwatch and the power you need to run a mouse. A modern cordless optical mouse, like a Logitech MX 700, will draw something like 80 milliamps (mA) from its two AA NiMH cells, in constant normal use. That's not a whole lot – it gives you something like a straight day of use from a couple of fully charged AAs (and, of course, you can recharge the batteries whenever you're not using the mouse).

80mA at the nominal 2.4 volts of the two rechargeable AAs is 0.192 watts. Wristwatches need a *lot* less power than that, which is why they can be powered by a feeble shaker generator.

Even a relatively big (11 x 3mm) G10 silver oxide button cell – which is considerably larger than the cells that power most wristwatches – will only have a capacity of 60 milliamp-hours at 1.5 volts. That's a big 90 milliwatt-hours, and it'll run a watch for, what, two years straight?

Actually, you'll usually get a couple of years of service out of a much smaller battery in a digital watch, but let's say only 24 months from a G10.

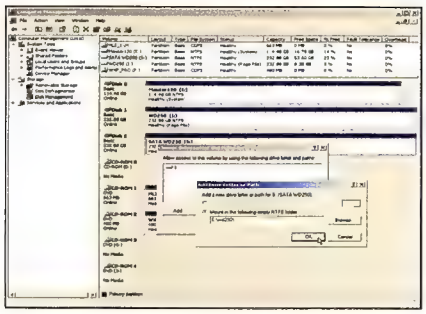
This adds up to a current draw of less than four *microamps*, at only 1.5 volts – about five microwatts. A 192 milliwatt mouse is drawing around 37,400 times as much power.

So even if you cut the power the mouse was consuming by a factor of ten, and increased the power the kinetic charging system produced by another factor of ten, you'd still be making less than three thousandths of the power you'd need to run the mouse.

X:, Y:, Z:, alpha:, beta:...

At work we have some users who have all their drive letters taken up with network drives. When they plug in a device such as a USB memory stick or a card reader we have to unmap a network drive to be able to access it. This is a real problem for the users, because they don't have admin rights to the machine.

So what I was thinking about doing was creating some shell folders which point to the UNC path in question instead. So instead of having, say, \\server\Data mapped to the G drive, you can have a folder in My Computer called Group Data instead. I got the idea from www.winguides.com/registry/display.php/73, which works in a limited way. It lets you put the folders in My Computer, but when you try and browse to somewhere to save your work, the folder doesn't come up.



ABOVE: Reducing drive letter clutter is easy, as long as network shares aren't involved.

Do you guys have any ideas on how to do this?
Wil Taylor

I don't think there's any way to do this in Windows.

There are a few ways to collapse multiple *local* drives on a Win2000 or WinXP system into one drive letter. Disk Management makes it easy to mount NTFS volumes as folders instead of drive letters, for instance, and the standard mountvol.exe utility lets you do the same thing and more from the command line. Even if you've got the Win2000 Resource Kit or the more fancy named XP version of the same thing, though, the extra Linkd and Delrp utilities won't help you with your problem. They, too, only deal with local volumes.

The way Microsoft want you to solve this problem is by doing the letter-reduction on the server side. If you've got Windows servers that are sharing multiple drives, you can concatenate those drives *on the servers* by the above methods, and thus have fewer drives being mounted on the clients. If you've got as many sharers as shares, though – your clients are mounting 24 shares from 24 servers – then there's no way around the problem without going for a fancy distributed filesystem solution.

Which Microsoft will, of course, be happy to sell you.

It worked for laserdisc...

Why aren't there double-sided CDs with twice the capacity?
Kevin

Actually, it's been done. The only problem is that it didn't work very well.

Nobody thought of making CDs double-sided when they were invented (not least because that'd make it impossible to put a label on one side), so the CD spec requires a standard thickness of polycarbonate on the data side, on top of the reflective layer. On the other side of the reflective layer is a thin coating of epoxy; that's why the 'label side' is so much more susceptible to scratch damage than the other, armoured side.

If you make a disc with polycarbonate on both sides and a two-sided data layer, you end up with a thicker disc than the CD standard allows; it won't fit properly in various drives, and may overstrain drive motors as well.

To avoid this, you could make a disc with half-thickness polycarbonate on each side, but then the laser will have trouble focussing. It expects the data layer to be 1.2mm under the surface of the disc.

The DVD format doesn't have these limitations. DVDs have the same exterior dimensions as CDs, but their data layer is in the middle of the disc, 0.6mm from each side. DVD was designed to accommodate 'flippy' discs, as well as the more common double layer single sided discs, from the outset.

DVD-ROM drives could therefore, physically, work with double sided CDs that're built like a DVD with the data layer in the middle of a 1.2mm sandwich rather than over on one side. But they don't. In CD mode, they expect a standard CD and work like a CD-ROM drive.

At least one CD-R maker, a few years ago, *did* produce double sided writable discs. Compatibility problems meant they didn't stay on the market for long, though.

Choke_a_horse.txt

I need to edit really big text files. Big as in about a couple of hundred megabytes, at least. On Windows. How do I do it?

I've fished through a few editors that claim to have large file support, but it looks like their idea of 'large' isn't the same as mine.

Even Emacs on 32 bit systems craps out at 128Mb. I discovered that Microsoft Word can handle incredibly big files if you're willing to wait (and turn off spell checking!), but that's just really horrible.

I don't need any special features in the editor, just speed. What should I use?

You should use TextPad (go to www.textpad.com to find it). It's good old fashioned, fully functional shareware, US$29 for a single user license, and it laughs at cutting and pasting 400Mb at a time. DR

Simon Peppercorn reveals a couple more Windows tweaks for security freaks.

Cleaning out the protocol cupboard

Have a think about how you go about mapping out your network. Make sure that any network adapters in your systems are only running the protocols and services they need to fulfil their specific role.

In other words, a network adapter which only connects to the internet doesn't need the Client for Microsoft Networks, or File and Print Sharing. In fact, if it has those services bound to it, you are creating a nice fat target for wannabe hackers. An adapter which connects only to the internet needs the TCP/IP protocol, *and nothing else*. Even if you connect to the internet through a router, then you are better off having two adapters – one for the internet and one for the LAN. That second NIC can host the File and Print Sharing service and Client for Microsoft Networks, if needed.

If you have a look at your network properties, you may find there are a bunch of protocols being loaded that you will never use. If you find IPX(NWLink) installed, and you don't have a Novell server, then remove it. But if you *do*, connect to a Novell server which happens to be Version 6, then you can still kill the IPX(NWlink) protocol because v6 of Netware fully supports TCP/IP.

If you have DLC installed, then there is a good chance you can ditch that as well. It's only used for communicating with older HP JetDirect devices, which are becoming scarce these days as most print servers now fully support TCP/IP.

As for the NetBEUI protocol, there is nothing technically wrong in leaving it installed. It won't create a security issue with your internet connection as it isn't routable and it's actually faster than TCP/IP in pushing packets around your network. It is unnecessary overhead however, if installed on a network device which is connected only to the internet. If you're not using a router on your LAN, then save NetBEUI for your internal network instead.

DOS the DOSers

If your adapter connects directly to the internet, you are susceptible to Denial of Service (DOS) attacks. Whilst these attacks are targeted more towards commercial web servers, it is not uncommon for unprotected home PCs to be the training ground for script kiddies. A few registry tweaks can toughen up the TCP/IP stack as a defence to such antics. Whilst not foolproof, it will make things trickier for the baddies.

Browse to 'HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\Tcpip\Parameters' and create the following DWORDS and values:

EnableDeadGWDetect = "0" – Prevents detecting a dead gateway and switching to another gateway in the event that no response is received.

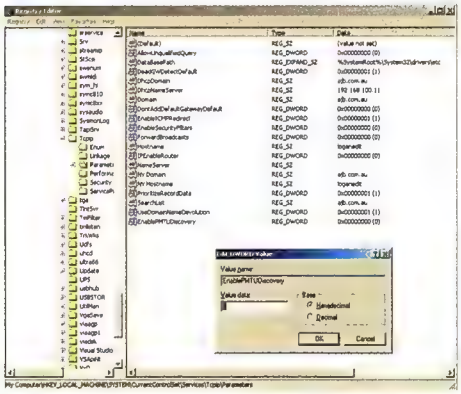
EnableICMPRedirect = "0" – Prevents Windows from changing its routing table in response to ICMP redirect messages.

EnablePMTUDiscover = "0" – By disabling MTU discovery, this could prevent a hacker changing the MTU to a tiny size and cause the stack to overload.

KeepAliveTime = "300,000" – This changes the duration between sending of 'keep-alive' packets.

NoNameReleaseOnDemand = "1" – Protection from instances of NetBIOS name-release assaults.

PerformRouterDiscovery = "0" – Stops a hacker from adding default route entries by spoofing IRDP routing advertisements.



For Windows 2003

SP1 for Windows 2003 contains the same firewall as that found in XP SP2, but with an important addition. By default, all inbound connections will be blocked until the latest security updates have been installed.

The service pack also contains a number of other significant security tweaks. For example, it strengthens defaults on traditional hacker targets, such as DCOM and RPCs, by enforcing a minimum layer of security for these services, regardless of whether or not an application that uses them has no security built in.

Also added in to the service pack is the capacity to quarantine remote VPN clients which may not have the latest security patches themselves and where customised scripts were previously required to achieve this.

A serious security exploit – one which allows nasty code to be executed from parts of memory that should contain no code – has now been closed. This was developed in conjunction with both Intel and AMD and relies on instructions already built into the hardware to do its job.

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Firewalls R Us

Despite the fact that many of the more security focussed techies put little faith in the inbuilt Windows firewall, including the latest firewall in XP SP2, it does contain some important features which are worth noting. If you have no other firewall running on your network, then do yourself a favour and get this one running, quick smart. It offers all the traditional firewall functions, such as the creation of static exceptions for ports and application, configurations of basic ICMP options and logging information.

The previous inbuilt firewall had a significant weakness in that it had to wait for the whole network stack to load before the firewall could kick in. The slower the computer, the longer it was exposed to attack. The new firewall addresses this by applying boot-time filters until it has established communication with a DNS and DHCP server or local services.

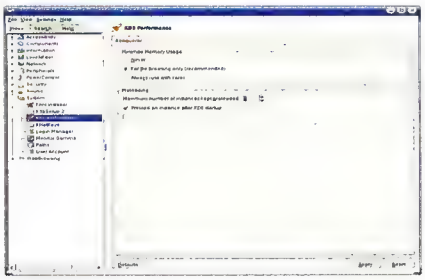
Linux TWEAKS

KDE the Konqueror? Peter Sbarski flies the flag for KDE in its war with GNOME.

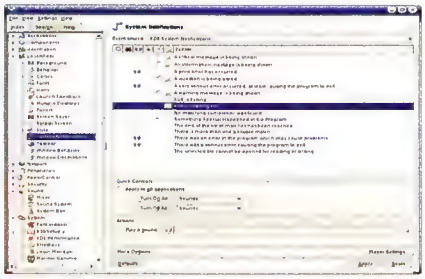
It has been a tradition over many years for Linux users to come together and flame each other indefatigably in an attempt to prove that their window manager or desktop environment was better, faster and stronger. In fact, the flames rage even today, and will most likely rage for years to come, when GNOME and KDE supporters come face to face. And, don't forget those that still haven't moved away from the CLI or use FluxBox and similar ilk.

KDE is a desktop environment that has had its share of successes and setbacks over the years. In fact, straight after its inception in 1996, many proponents of GNU criticised KDE developers for using the proprietary Qt toolkit. Then there were the GNOME vs KDE wars. Then people blamed KDE for having too many features (feature creep) and lambasted it for poor performance. Still, the KDE team persevered and continued to do their job and KDE steadily improved.

Currently KDE is up to version 3.3.1 (stable) so if you want to give it a try go to www.kde.org/download.



ABOVE: Preload Konqueror at startup and it will load much faster when you want it.



ABOVE: Get rid of those annoying sounds or use your own.

This month we bring you some tips and tweaks to help you get acquainted with KDE and even optimise it a bit. All these tips assume that your version of KDE is 3.2 or higher.

Konqueror

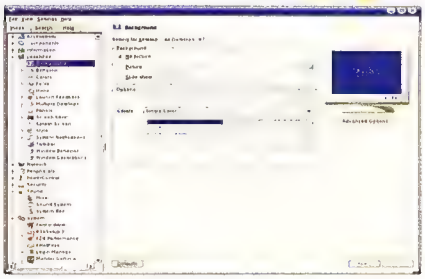
KDE's Konqueror is a nifty web browser that is HTML 4.0 compliant and supports Java, JavaScript, CSS1/2, SSL, etc. In fact, Apple's Safari browser uses Konqueror's KHTML engine. If you use Konqueror too you can make KDE preload it at startup to make it appear faster when you execute it. To do so open KDE Control Center –> System –> KDE Performance. Select to 'Preload an instance after KDE startup' and then click Apply. You can make KDE preload more than one instance of the browser at startup by changing the 'Maximum number of instances kept preloaded'. Note that each instance will take up a bit of memory so don't go overboard.

Auto-scroll

Konqueror has an excellent little feature that many users don't know about. If you press shift and the down arrow the page will automatically scroll down. If you press the down arrow a few more times the page will scroll faster. You can also reverse direction by pressing shift and up. You can pause and resume scrolling by pressing ctrl. Finally you can increase and decrease the font by holding ctrl and turning the wheel on your mouse.

Startup services

KDE loads a number of services at startup which you may not need. You can shutdown some services from the taskbar while others you can only shutdown from the Service Manager. For example, to prevent the Korganizer alarm daemon from loading at startup right-click on its icon (it looks like calendar with a bell) and deselect Start Alarm Client at Login. To prevent other applications from loading open KDE Control Center –> Components and click on Service Manager. From the Startup Services frame deselect all services you don't want to load at startup.



ABOVE: Use a single colour rather than an image and KDE will render the desktop faster.

Disable sounds

Just like Windows, when you enter or exit KDE it plays an annoying sound. You can turn it off to make startup and shutdown quicker (and less irritating). Open the KDE Control Center, click LookNFeel and then on System Notifications. At the top of the window from the Event Source box select KDE System Notification. Just below it you will see a list of different events. From this list select KDE is Starting Up and in the Actions frame below deselect Play Sound. Do the same for KDE is Exiting.

No splash screen

You can remove the splash screen which appears when KDE loads to make it start a little faster. Open the file called 'startkde' (it is usually found in /usr/bin), find the line: `ksplah -nodcop` and comment it out.

Be simpler

If you use KDE on older hardware and if the desktop seems really slow try this. Disable the wallpaper and use a constant colour instead. In the KDE Control Center click LookNFeel –> Background. Select 'No Picture' and then select a colour to use from the Options frame. Click on the Advanced Options button and increase the size of the background cache. In the same window deselect the Enable Shadow option. Under LookNFeel –> Fonts deselect Use anti-aliasing for fonts. Under LookNFeel –> Style click on Effects and make sure that all GUI effects are turned off. Finally click on Miscellaneous and deselect Transparent toolbars when moving and Highlight buttons under mouse.

KDE autostart

If you need to load a service or execute a script when KDE starts there are a number of different ways you can do it. One way is to put a symbolic link or a script in the ~/.kde/Autostart directory. Simple and quick.

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The silent PC project Part 1

Tired of having a tornado in your PC? Ron Prouse embarks on the ultimate modding project – a PC both powerful *and* silent.

There are two means to a quieter PC – modding what you've already got, or building one from scratch. In part 1 of this tutorial we'll cover how to make a dent in the noise wall your PC pumps out day to day.

***Noise** (pr: noiz) n a sound, especially one that is loud or disturbing – Collins English Dictionary, 1998.*

Back in the 'old' millennium it was cool to own a PC that had serious aural presence – in fact, the ultimate modding achievement was a mid-tower that sounded similar to a hovering Harrier.

The need for all of this system cooling was easy to justify – hot hardware.

Most performance PC's of the era were packed full of heat generating components, with multiple optical (CD burner, DVD ROM) and (at least two) hard drives being the 'norm'. PCI slots full of expansion cards that baffled airflow, and increasingly larger power supply units (PSU's) that were required to keep all of this stuff spinning and whirring.

With less airspace and more heat, the next consequential symptom of 'PC warming' was the rise of ambient case temperatures – affecting the performance of CPU and GPU heatsinks, and threatening to turn the whole shebang into a large puddle of molten stuff that would no longer compute.

For many of us the solution was fairly simple – dramatically increase the circulation of cooler air through the case, accomplished by adding as many externally vented fans as possible.

It seemed at this time that everyone was busy discussing case airflow performance in massive CFM (Cubic Feet per Minute) numbers, while the dBA (weighted decibel scale) rating was considered to be a 'higher is better' factor. The sight and sound of 15+ case fans in a single tower became quite common, and when that effect was multiplied by large numbers at a LAN event ... well, it's an experience!

Then suddenly, the rules changed. Noise was bad. Extreme air cooling was evil.

Whether it was the influx of water-cooling that helped spark this revolution, or if it were just an outcome of it, is irrelevant. The simple fact is that, for many enthusiasts, the 'search for silence ' had become the new Holy Grail of computing.

For the first time people were referring to our performance-driven multi-fan PC's as 'noisy', and with that label came the stigma of being environmentally unfriendly and socially inappropriate – like smoking, farting and scratching ones genitalia a little too vigorously. Being called a 'FanBoy' was no longer a *very good thing*.

What we used

PC Case Gear

www.pccasegear.com Ph: (08) 9584 7266
We would like to thank PC Case Gear for supplying the products used for testing and comparison. Nearly all of these items should be easily procured at your local computer or electronics retailer at similar prices to those quoted, with the exception of the SilenX PSU for which PCCG is the Australian distributor.

Fans

Papst 80mm 8412 NGML $21.60
Panaflo 92mm / 120mm $19.50 / $35.00
SilenX Fan 40mm / 80mm / 92mm / 120mm
$23 / $23 / $29.70 / $36
Evercool PC Air Conditioner $16.50
Enermax Speed Dial Fan 80mm $26.00
Evercool 120mm $29.00
Zalman Bracket with 92mm Fan $18.00
Evercool Fan Speed Controller $8.50

Power Supply

SilenX 400W iXtreme Pro $159.95

We also need to mention Jaycar Electronics at Clovelly Park Adelaide who provided Ron with the Digitech QM1588 Sound Level Meter used in the comparisons.

Disclaimer

Powertools, sharp objects and electrical energy can all be dangerous to your current state of wellbeing, so take care and follow all relevant safety precautions (especially eye protection). If you are unsure of such precautions, seek professional advice. Any concern regarding possible hazards is not the responsibility of Atomic Hardware Media or the writer.

So, how did these new-age computers become so aurally unobtrusive?

Part of the equation certainly revolves around recent changes in hardware. Today's bleeding-edge computer only needs one optical drive (which will burn / play every media-type known to man) and will probably only have one single, but enormous, hard drive. Advances in these two components alone will reduce a considerable amount of noise and heat. More efficient PSU's now have larger heatsinks with multiple thermally controlled fans, and most motherboards include a plethora of 'on-board' features that minimise the amount of space-chewing expansion cards required for full functionality (RAID, FireWire, GigaLAN, Wi-Fi, sound, etc.)

Less heat-generating sources in a less cluttered area, rounded cables, aluminium enclosures, larger fans, passive heatsinks and anti-vibration measures all contribute toward a more thermally-efficient environment, and therefore less additional cooling is required. And less cooling, of course, equates to less noise.

However building a new and quieter box from scratch requires a serious investment. Thankfully, we can apply some elbow grease to currently built machines and achieve at the very least a good result, and give your noisy beast machine a new lease on life.

Understanding sound

It helps to understand the basics of PC-generated noise, the methods we can use to measure it, and what methods can be used to reduce it. To establish a framework that helps quantify where our PC's fit in the big scheme of things, this 'Chronology of Noise' looks at the relative intensity of some common sounds in our everyday existence.

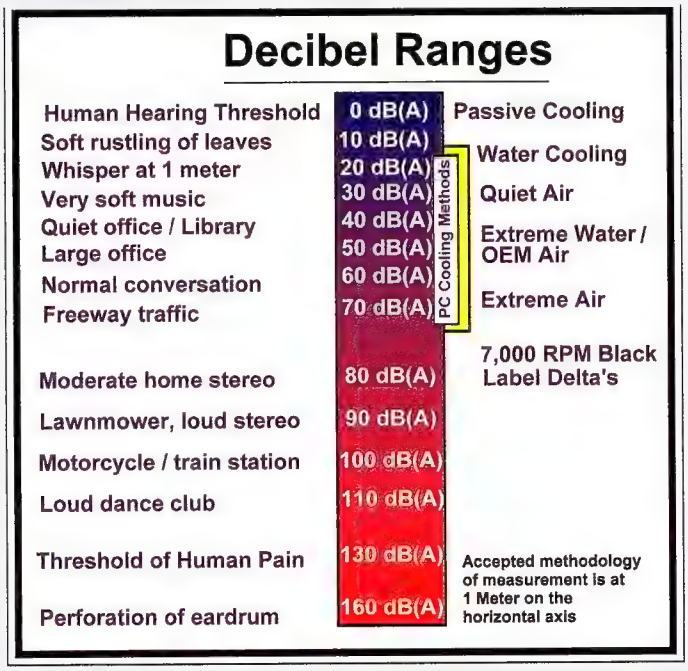
Firstly, it is important to understand what sound really is. Sound is generated through vibration, or more correctly, sound is a series of pressure waves created by those vibrations, carried through the air to our ears. The pressure waves can vary in *frequency*, which causes them to sound higher or lower, and *intensity*, or how powerful the sound is. The latter is measured in decibels (dB) that relate to sound pressure levels (SPL).

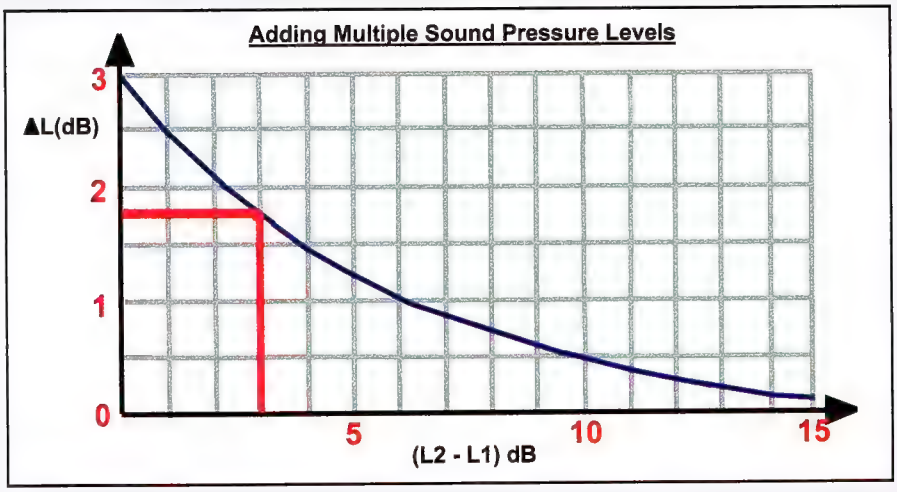
Usually we restrict the term *sound* to mean pressure variations which can be detected by the human ear. The basis of human hearing requires that the frequency of the variations occur at a minimum of 20 times per second, but not more than 20,000 times per second, expressed as 20kHz. Just how sensitive is the human ear? The human threshold of hearing corresponds to air vibrations one tenth of the diameter of an atom!

There are several different measurement scales used to measure the intensity of sound, with the most common being the one used here, 'dB(A)'. This scale applies a formula to a decibel measurement to compensate for the frequency limitations of the human ear. To compare sound levels we used a Digitech QM1588 Sound Level Meter which features an extended 35-100dB range, and automatic 'A' weighting.

It is very important to note that the decibel scale is not linear; it increases exponentially. The sound intensity of a given source doubles for every three decibels it registers on the scale. In other words, a source recorded at 53dB is twice as loud as one recorded at 50dB. It is also important to note that a difference of a few dB is barely perceptible, and humans will generally perceive a 10dB change as a 2x change in loudness. In other words, our ears will usually only perceive a major change as a minor event.

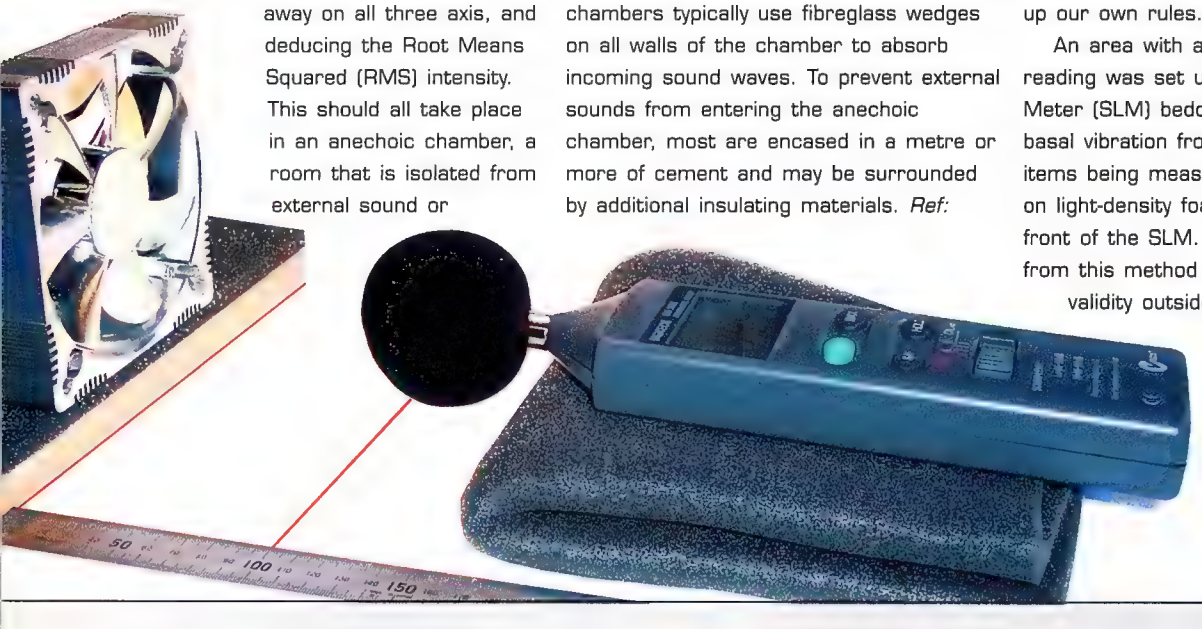
Which helps to explain the whole 'Turn that music down!' issue at home.





A Meter at a Metre!

The accepted method of measuring sound levels is from one metre away on all three axis, and deducing the Root Means Squared (RMS) intensity. This should all take place in an anechoic chamber, a room that is isolated from external sound or electromagnetic radiation sources, and prevents the reflection of wave phenomena [reverberation]. Anechoic chambers typically use fibreglass wedges on all walls of the chamber to absorb incoming sound waves. To prevent external sounds from entering the anechoic chamber, most are encased in a metre or more of cement and may be surrounded by additional insulating materials. *Ref: Wikipedia encyclopedia*



As our labs aren't usually decked out with full sound proofing, we had to make up our own rules.

An area with a constant ambient dB(A) reading was set up, with the Sound Level Meter (SLM) bedded on foam to minimise basal vibration from the benchtop. The items being measured were also rested on light-density foam, 100mm directly in front of the SLM. The readings gathered from this method will not have individual validity outside of this framework, but they can be related to each other. In other words, its not the actual numbers that are important, it's the differences that matter!

The Starting Point - Power Supplies

Apart from providing a clean and regulated source of power for the entire computer, the Power Supply Unit (PSU) is also the most universal source of excessive noise. Many people are content to run with the PSU that came with their case, especially if the manufacturer also sells standalone power supplies – such as AOpen, Enermax and Antec – but if your current PSU is a 'no name' generic unit, then our recommendation is that it should be the first component that you upgrade, for several reasons.

Firstly, a poor quality PSU will often cause system instability, even at stock settings. Overclock the PC, and the instability can become worse.

Secondly, many 'cheaper' power supplies do not have reliable short-circuit, over-voltage and over-power protection. If something does go wrong, such as a power surge, they are more likely to facilitate the destruction of other components.

Thirdly, a $200 PSU should last nearly 10 years in a 24/7 work environment, making it excellent value for money when comparing it to other PC components.

Although opting for a good brand-name PSU infers a guarantee of quality power delivery, the same cannot be said about the amount of noise that it emits whilst it does its thing. All manufacturers make claims about noise output, however these figures are usually based on the PSU running in optimal circumstances, with thermostatic fans running at their lowest settings, cool ambient temperatures and the unit under light load. In more stressful situations, with fans running at full speed, and the test meter aimed directly at the exhaust fan, the reality changes considerably. See Table 1 below for a comparison of some popular PSUs, and a SilenX PSU specifically designed to reduce noise.

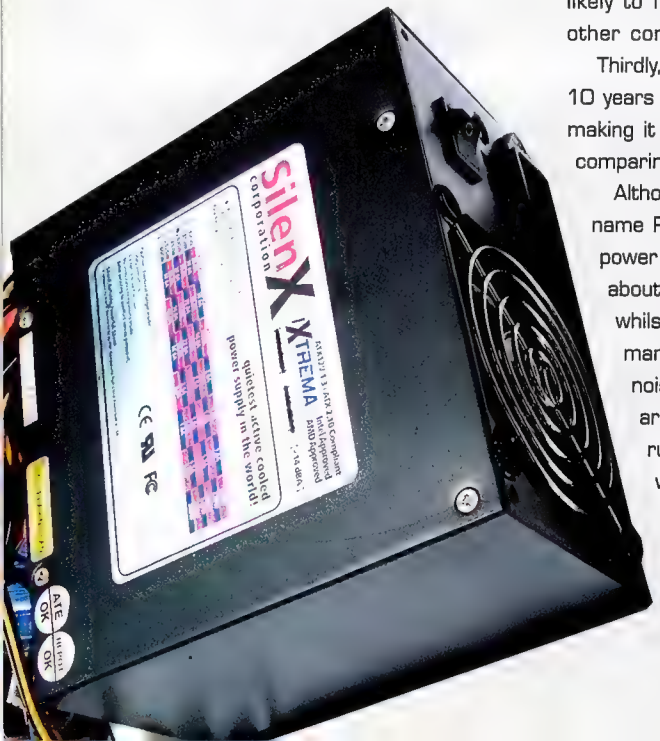


Table 1: PSU sound level readings		
Cogen	350W	61.4dB(A)
Antec True Power	430W	59.3 dB(A)
AntecTrue Power	550W	59.6 dB(A)
Enermax EG365	350W	53.2 dB(A)
SilenX iXtreme Pro	400W	44.1 dBA

It is important to remember the 17.3 decibel difference between the two test extremes is not just a 25 percent linear variation, the perception to the human ear is that the Cogen unit is three times louder than the SilenX PSU.

An Old Skool Solution: There are several ghetto methods that have been used to quiet down a PSU, and initially they all appear to work effectively. *Initially.*

One method is to de-solder the negative (black) lead on the PSU cooling fan(s) and connect it to the +5V (red) rail. This will effectively have the fan running at 7V, reducing the fans speed and airflow, and making it appreciably quieter. This is the overall safest of these mods.

Another method is to disconnect the PSU-fan from the standard power rails, and power it through an external rheostat, making the fan's speed infinitely (manually) adjustable. Great if you like the word 'manual'.

An alternative is to replace the PSU-fan with a 'smart' fan, which automatically adjusts its speed thermally. This only works if the fan responds relatively closely to the PSU's airflow requirements.

The absolute extreme is to remove the cooling fan(s) altogether, and gamble that other case-fans will provide enough positive internal air pressure to maintain airflow through the PSU. Pure crazy stuff.

The issue is that all of these options have risks attached, some of which can be quite serious.

Firstly, the capacitors inside a PSU can hold dangerous levels of electric charge long after the power is turned off. Dismantling the PSU, cutting wires and soldering onto the PCB is fraught with danger if you don't discharge the capacitors first. The other risk is less obvious. The circuitry inside a PSU is designed to run at certain temperatures, maintained by airflow over heatsinks, very similar to CPU cooling. Slow the airflow, and things begin to heat-up considerably more than it was designed to cope with. Cheaper PSU's invariably have thermally 'softer' components than their better engineered relatives, so a build up of excessive heat can cause failure – or in the worst case scenario, fire.

Because of this, our experience has been that the inherent hazards of 'quiet modding' a PSU far outweigh the benefits – it is smarter to buy the safe, factory-engineered unit rather than risk burning down the house as you sleep.

Fans, fans, and more fans

One of the main advances in Quiet PC components has been to the humble case fan. A few years ago the choices were mainly restricted to a few generic brands available at local electronics stores, or high-priced specialist units such as Papst and Panaflow. And there was a restriction on fan size – very few options in sizes larger than 80mm, and they were usually noisy, high-output industrial units. This meant that to achieve good case ventilation usually required multiple 80mm fans running at high speed (eg four fans moving 25-30 CFM at 60dB(A) each), resulting in a large amount of air turbulence, and therefore noise.

Technological advances have changed this status quo considerably, with fluid bearings, improved blade designs and less restrictive chassis shape reducing the noise output from 80mm fans considerably.

Again we see that with products catering to the quiet PC market do actually have an impact.

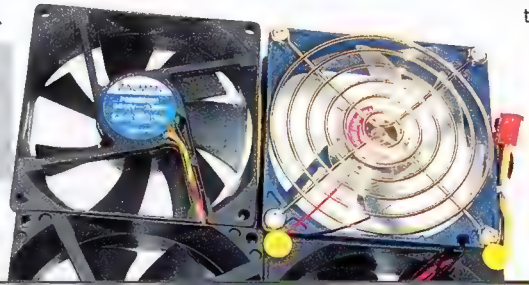
So, in the example of the case with four fans, in a 2X inlet/exhaust arrangement, changing over to a more efficient fan design can cut the noise by 50%, with only a small loss (<8 percent) of cooling performance. The advantage for the owner of an older case is that swapping-out 80mm fans with the same size requires no additional modding, just a screwdriver and a little time.

But, if you like it bigger?

Recently, one of the obvious revolutions in case (and PSU) cooling has been the use of larger fans at lower speeds, normally 120mm units moving air at 80-100 Cubic Feet/Minute (CFM) at speeds under 2000 RPM. There are several advantages to using larger fans, the key being that a large amount of air is moved through the case with a minimal amount of turbulence. One of the reasons for this is that larger diameter fans are better able to overcome hydrostatic pressure. The best analogy is a river, where more water will move smoothly through a deep channel rather than splash through shallow rapids. See Table 3 below for a comparison of popular 120mm fan units and the difference a quiet-engineered fan can make.

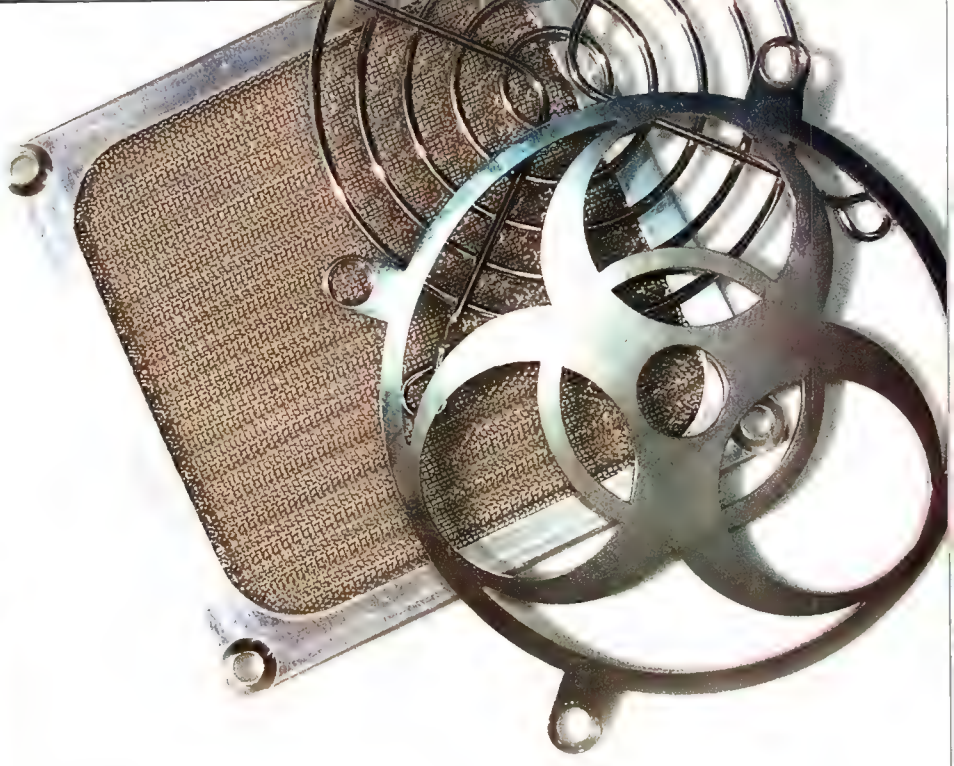
Another positive is the tonal pitch of a larger fan, which will vibrate at a lower frequency. This places the noise at an area of the sound spectrum where the human ear is not as sensitive, and therefore we will not be as 'aware' of it. Conversely, small fans running at high speed emit a high-pitched whine that is very obvious.

The other strength of 120mm fans is that if they are run at 5 or 7V they become whisper quiet, while still moving impressive amounts of air.



I think I'll have the mixed grill

Remember the definition of sound – 'generated through vibration, or more correctly, sound is a series of pressure waves created by those vibrations'. It is easy to overlook a major source of vibration – airflow turbulence through fan grills and filters. Running measurements over a series of fan sizes and grill types shows just how much noise can be generated by obstacles in the path of the airflow.

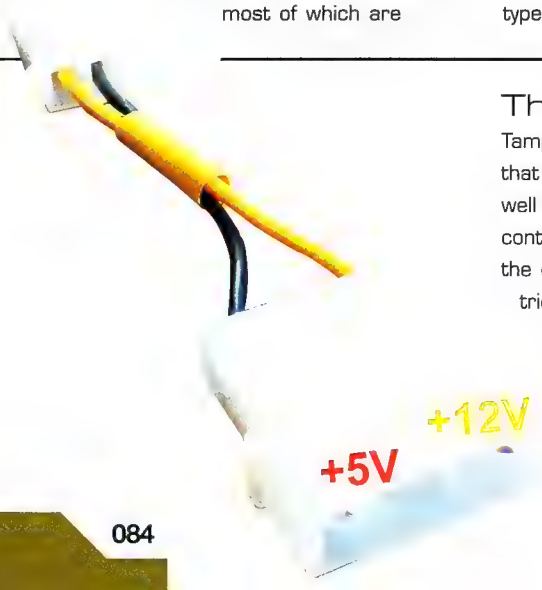


On exhaust fans the impact of grills and filters was almost negligible, with such small numbers measured that they were not worth recording. What these figures do show, however, is that fitting laser-cut grills to 3 X 80mm intake fans will nearly double the perceived sound output of those fans. To keep the PC as quiet as possible, standard wire grills are the best choice.

How to slow down what goes round

If changing fans sounds too expensive, then the cheapest 'off the shelf' alternative is a speed control switch – most of which are simple 'hi-med-low' resistance-switching circuits, as opposed to the more expensive variable-speed rheostat or pulse-modulating BayBus controllers that we will look at later.

The main thing to remember with any type of fan controller is that they are only making the fan quieter by slowing the rotation of the blades down to less revolutions per minute (RPM). Less RPM also means less CFM air volume. So the fan is quieter, but also less efficient at moving air.



The Old Skool Method

Tampering with fan speeds is an art form that dates back far into the last millennium, well before the advent of the commercial controllers mentioned above. This is one of the original (and probably most useful) tricks, and it forms the basis of the FanBus discussed below. All Molex connectors have the same wiring format for the four pins; Yellow (+12V), 2 X Black (ground), Red (+5V). By using the yellow as the positive lead for a fan, and the red as the negative, the power supplied will be the 'potential difference' of the two (12V - 5V), being 7V. A crossover lead such as above is useful for reducing a fan's output temporarily (eg. a winter period). There is only one thing to note – some fans require more than 7V as a starting current. If you use the 7V method and the fan doesn't work... well, it won't work!

We know what you do, *Mister* Anderson

In 1999 the desire to get some variable speed control over noisy case-fans was the mother of a landmark modding invention – Cliff Anderson's famous 'FanBus' www.fanbus.com. By using the different PSU potential voltages as explained above, it was possible to formulate three different voltages, +12V, +7V and +5V to run any PC fan at the equivalent of 'low', 'medium' and 'high' speed. This is a pure switching device, not a variable system such as a rheostat or voltage modulator. The main feature of the FanBus was that it could be used to control all of the fans in a case, at different voltages. Quick connectors also made it easy to 're-wire' everything at a minutes notice.

What about washers?

We first covered siliceous washers and sheeting in the Couch Potato project, where they provide quite impressive. As we have established, sound is vibration and, just as an acoustic guitar body amplifies the sound from a plucked string, the big metal box that is a PC case will amplify any inherent noise inside it. Side -covers rattle, fans whir and OD/HD drives whine as they spin up. By using silicon dampners on or around mechanical components, most vibration, and therefore noise, can be virtually eliminated. We didn't rate the effectiveness of dampners in our tests, however it's fair to 'guesstimate' that over an average case the reduction would be two to three decibels.

Conclusion

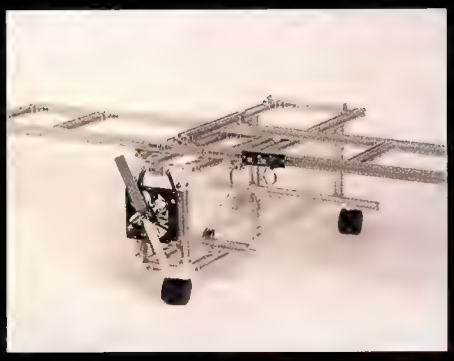
It is amazing to see just how much difference a few small changes can make to the noise output from an average, mid-tower PC. Applying all this theory to an old labs machine with an aluminium case, we replaced two existing ADDA front 80mm inlet fans and the rear 80mm exhaust with SilenX SX-080-14 units running at 12V and using the enclosed silicon dampners, replaced the Antec True Power 430W PSU with a SilenX iXtrema Pro 400W, and placed some noise isolating foam on the desk shelf, under the computer case (more on this next month).

For the sake of measuring the noise difference, the Digitech QM1588 Sound Level Meter was pointed directly at the front of the case, from a distance of one metre. The ambient noise level was a constant 44dB(A). The 'before' reading was a hefty 62.1 dB(A), while the 'after' result was 53.6 DB(A), an incredible difference of 8.5 dB(A). In effect, the PC was now effectively making half the racket that it was before.

Although there are a myriad of products and modifications that will help to quieten a PC, many of which will be covered next month in Part 2, the truth is that there are huge gains (or losses, depending on how you look at it!) to be made with current systems just by getting the 'basics' right.

Winnie the Pooh

You can only enter once per competition or you'll be disqualified. You must provide a postal address and phone number for prize delivery when you enter (not a PO Box).



3 x Xcom Lubic cases

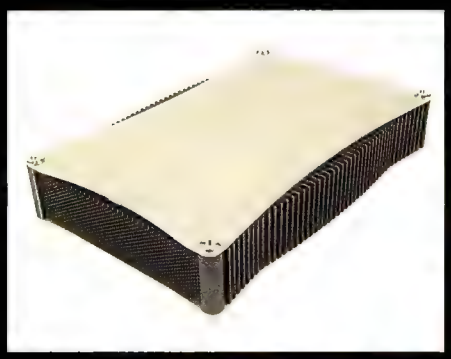
Building your very own PC case has never been easier, thanks to Xcom's Lubic case. Complete with an ample supply of quality materials and a few guidelines and ideas to get you started, this kit will bring out your inner designer. Add to this the Lubic kit, which provides supreme cooling for your *red-hot* creation, and the Xcom Lubic case is the box you want. Thanks to lovely Xcom, we have three of these sexy beasts to give away.

Q Who created the X-Com series of games?

3 x Microsoft Xbox consoles

Fast becoming the most popular gaming console, Microsoft's Xbox is your ticket to endless entertainment. With an ever expanding choice of games, fantastic online play through Xbox Live!, and some of the hottest exclusives to hit the console scene, Xbox isn't only about games – it's a way of life. Overdrive Computers is giving you the opportunity to be part of the Xbox phenomenon and have provided us with three to give away.

Q Which company recently teamed up with Microsoft to develop the graphics chip for the next-generation Xbox?



1 x KC31U2/KC31 combo external drive

Fortuntec's KC31U2/KC31 external drive will firmly secure your spot with the computing elite, thanks to its awesome heat dissipation and sturdy aluminium structure. Sporting a USB 2.0 Hi-Speed connection, multi-OS support, and an eye tingling sexy cold blue LED display, you won't be able to pull yourself away from its loveliness. If you'd like to win one of these compact masterpieces, well, you're in luck, because Fortunetec has given us one to give away.

Q What does the acronym 'OLED' stand for?

EMAIL ENTRIES TO WIN@ATOMICMPC.COM.AU OR POST THEM TO: ATOMIC, PO BOX 2286, STRAWBERRY HILLS NSW 2012. PLEASE SEND A SEPARATE ENTRY FOR EACH COMPETITION. PLEASE ENSURE THE COMPETITION NAME IS THE SUBJECT OF THE EMAIL, OR IS DISPLAYED CLEARLY ON THE FRONT OF THE ENVELOPE. THE CLOSING DATE FOR ENTRIES IS 21 FEBRUARY 2005. WINNERS WILL BE ANNOUNCED IN ***ATOMIC 51***.

Atomic 47 winners: 5 x four-litre Thermo-electric cooler and warmer units + 5 x PC cigarette lighter panels. Q. What year was the first built-in refrigerator launched and by what company? A. 1930 - Electrolux. C. McMillan, Biloela, QLD; K. Chen, Penshurst, NSW; G. Fernando, Bella Vista, NSW; J. Yen, Wonga Park, VIC. 6 x three-month subscriptions to Ragnarok Online + Ragnarok Online game CD. Q. What type of mythology did the name 'Ymir' come from and what was the Ymir? A. Norse mythology, primordial giant and progenitor of the race of frost giants. Y. Zheng, Burwood East, VIC; A. Ma, Lower Templestowe, VIC; F. Wong, Glen Waverley, VIC; P. Merwarth, Seacombe Gardens, SA; T. Denkewitz, Mapleton, QLD; S. Gordanovski, Deer Park, VIC. 2 x Logitech MX-1000 mice. Q. What were the names of the two mice that originated in the Disney movie [i]Cinderella[/i] and continued on to star with such celebrities as Mickey Mouse and Donald Duck? A. Gus and Jaq. K. Soo, Rockdale, NSW; P. Soper, Palmerston North, NZ. 2 x NEC 3500A dual-layer DVD burners. Q. What was the rating given to this product in last month's issue of [i]Atomic[/i]? A. 9.5. D. Chambers, Mt Waverley, VIC; B. Horsell, Marleston, SA; 2 x Half-Life 2 Collector's Edition and 3 x Half-Life 2 Retail. Q. What was the name of the marine that player's controlled in the Half-Life expansion pack Opposing Force? A. Adrian Shepard. 23 x Collector's Edition Half-Life 2 packs. E. Bools, Somerton Park, SA; G. Pell, Mitcham, VIC; J. Cimble, Deception Bay, QLD. 3 x Half-Life 2 Retail. K. Remmes, Oxley, QLD; P. Gasselstorfer, Hamersley, WA.

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When your old PC is your best friend

Maurice 'Moz' Ford learns one of life's most important lessons.

I'm one of those strange people who doesn't upgrade their PC every six months. Don't get me wrong – I'd *like* to, but financial constraints limit my spending to carefully selected games, music, DVDs, rabbit paws and lottery tickets.

For a good few years I'd been running a GF2 MX video card. It was great when it first came out, but then games started to get a little more graphically demanding. It finally got to a point where it 'did the job'. Just. Games were all low res, low detail and never indulged in flashy anti aliasing or anisotropic filtering. The frame rate resembled a slide show – much to the amusement of my friends...and my frustration. Can anyone say '*pwnage*'?

Then one day I made the discovery that I had enough money saved to allow a little indulgence in my life. What to get? It was no contest really. My first pot-bellied pig and a new banjo would have to wait. It was time to upgrade!

A week later I sat at a virtually new machine playing my favourite FPS. It was everything I had ever dreamed it could be! My eyes bathed in the visual perfection that I had been denied all those years. The sky! The water! The dopey expressions on the Bots! Even the smoke trail of the RPG that took out our chopper and sent us all hurtling to our deaths had me transfixed with delight!

I became a game junkie. My hard drive quickly filled as I loaded and reloaded all my games and meandered dumbfounded through a new universe of graphical magnificence.

But then it started – the crashing under load. I used every ounce of my l33t skills to track the problem down to no avail. Depression set in. And it was in a moment of despair that disaster struck.

I had rebuilt the machine, reloaded the drivers and had let it run through some benchmarks while I watched TV. I walked back into my room to find a blank monitor. Puzzled, I took another step...and then the smell of burning silicone hit me. I rushed to the case and there it was. The HSF had *fallen off the video card* and now sat happily buzzing away on top of my sound blaster.

I was stunned. The clips....I had checked the clips on the HSF...how in Microsoft's name could they have come loose? So loose that the HSF would actually fall off the card?

I contacted the company that I bought the card from. They were most apologetic and thankfully didn't laugh openly at me, but neither could they help. In the blink of an eye, $250 and all my dreams had been flushed down the toilet of life.

Devastated, I rang my mate Dave to lament my loss.

'Well, look on the bright side!' he replied cheerfully.

'What's that?'

'At least it didn't happen to me!'

Maybe it's time to upgrade my friends instead.

Crashtest #22 - "Accidental Day Jobs, Deux"

Written & Illustrated by Craig Simms © Copyright 2005 Atomic Maximum Power Computing

atomican

As the chitonous clicking of cicadas signals summer in Australia, so does the cacophony of case fans herald summer for Atomicans.

With their heat-stressed video cards rendering their games, err, *unrenderable* Atomicans retreated to the cool green of the online forums for recreational respite.

There were plenty of hot topics...

In the PC Games Forum, the long awaited release of *Half-Life 2* lingered like a post-coital *petite mort* after five years of foreplay.

Those who had finished the game on all difficulty settings, including the challenging 'strangled by tight souvenir t-shirt with mouse axes inverted' mode, reminisced by re-reading the year's 9285 threads about the game.

From wild predictions, release countdowns, and pre-reviews to 'OMG-OMG-I-HAVE-IT!ONEONE111!!!' and 'you know? it wasn't that good after all'...HL2 was an eloquent illustration of the gamer's great eternal cycle of hype, hope and hoopla.

Over in the Tech Talk Forum, Ricee007's seemingly simple request – how to overcome a parental lockout so a friend could use their webcam – careered wildly off course. Tech tips were few as the feathers flew in an ethical debate about the morality of using one's geeky gifts for evil undertakings.

VP747's lateral suggestion ('just get your friend to take nude photos of herself and give them to you on a flash card') cut neatly to what many suspected was the, ahem...soft core of the issue.

Meanwhile, in the Building and Troubleshooting Forum, Blueeyed Iceman sought assistance for a PC that 'keeps freezing'.

Iceman...? Freezing...?

Not a *hot* topic, but an unseasonably ironic one.

POTM 49

Elevating ASCII art to a bent new high, but while still grounded in the darkest depravity of the gutter of ungodly evil, comes Mr Scrub's tale of Bob. Avert your eyes, children, all others, look here for comedy genius and creative wit:

Bob: a very special story.

By Juggalo Scrub

www.atomicmpc.com.au/forums.asp?s=1&c=1&t=50102

We've got something new and exciting for you to put your hand on, Mr Scrub, coming your way from Logitech.

As always, our thanks and deep-seated gratitude go to the mods for helping with the as-usual very long shortlist of specially selected nominees.

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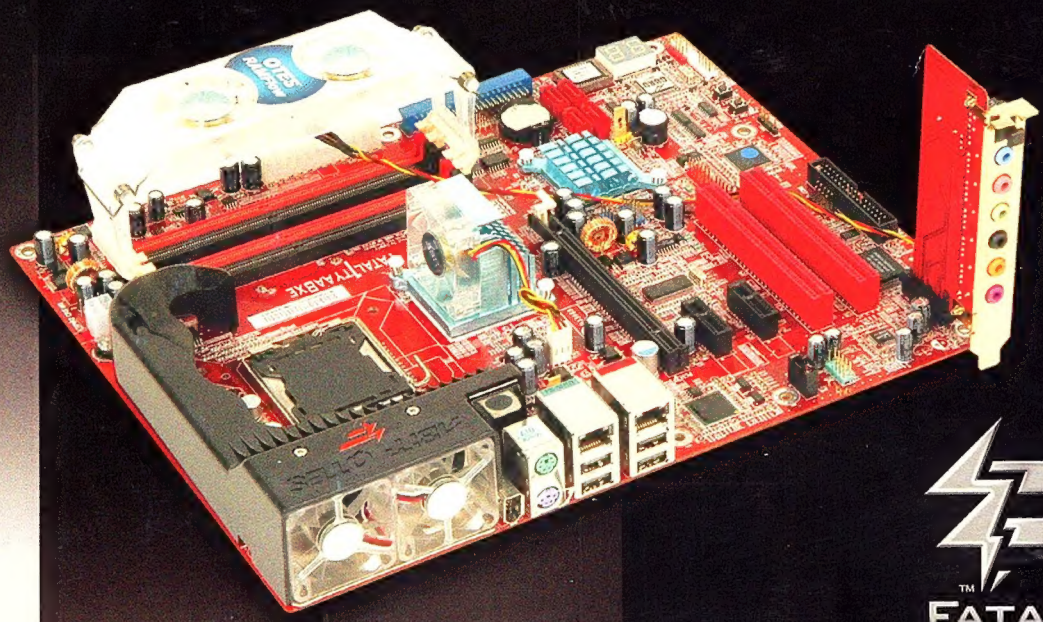

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